

# airlift

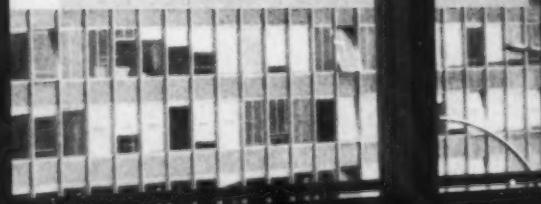
WORLD AIR TRANSPORTATION

APRIL, 1961

*sign*



*V-24-11*



## Rome's Leonardo da Vinci Airport

STATE UNIV OF IOWA  
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# AIR NAVIGATION... ITT ACTS WELL AHEAD OF PROBLEMS



## DME • TACAN • VORTAC ITT'S ANSWER TO MANY OF TODAY'S TRAFFIC CONTROL PROBLEMS

Just five years after the famous Wright brothers' Kitty Hawk flight, ITT started in avionics. With such a heritage in air navigation it is no wonder ITT developed DME—distance measuring equipment which provides pilots with distance accuracy of plus or minus two-tenths of a mile, yet weighs only 35 pounds.

ITT's DME aboard today's aircraft tunes to any DME, VORTAC or TACAN ground station for continuous distance information. The development of VORTAC and TACAN, the civilian and military rho-theta systems, is an ITT achievement typical of its great capabilities in avionics. Now even greater resources are attainable through the fusing of two divisions to form ITT Federal Laboratories. In a single company are Research and Development plus Manufacture, Maintenance and Service... ready to serve the military and industry with the shortest possible cycle between initial concept and delivered system.



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## *Most successful first flight in missile history*

Historic first firing of Minuteman, the U. S. Air Force's first solid-fuel intercontinental ballistic missile. Completely successful, this flight marked the first time in history that so many missile components were tested on initial flight: three rocket stages, full guidance system and nose cone. Compact, quick-firing Minuteman missiles, scheduled for operational status by mid-1962, will be stored ready for instant action in underground silos and on special trains. Boeing is responsible for Minuteman assembly and test, design and development of launch control and ground support systems.

### Capability has many faces at Boeing



**SKY TANKER.** Boeing KC-135 jet tanker refuels bombers and fighters to provide greatly extended range. This versatile Boeing jet is also a military transport. The United States Air Force recently ordered 30 C-135s, cargo-jet version of KC-135.



**TESTING. TESTING.** Boeing electronic system tests effectiveness of radar and countermeasures systems. Boeing is widely active in electronics—in research, design, manufacture and test, and in the assembly of systems for Air Force's BOMARC and Minuteman missiles, and Dyna-Soar space-glider.

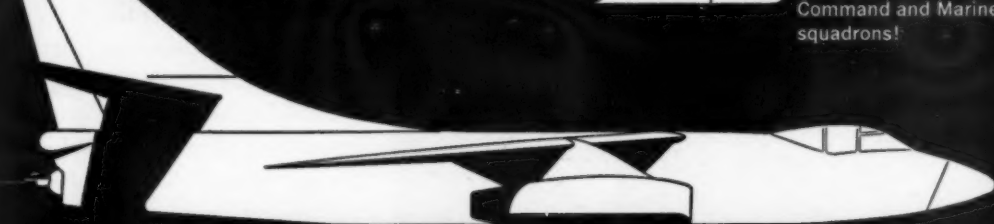
# **BOEING**

One of a series of advertisements showing the breadth of Douglas experience being devoted to commercial, military and space-exploration projects.

Douglas A4D-5 Skyhawk —  
America's smallest nuclear bomber  
can carry 18 bombs, 2 missiles!



Douglas F4D Skyray —  
on duty with Air Defense  
Command and Marine  
squadrons!

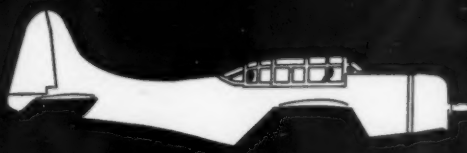


Douglas A3D Skywarrior —  
largest carrier-based bomber;  
also handles photo-  
reconnaissance and electronic  
countermeasure missions!

Douglas AD-4 Skyraider —  
can mount an armament  
more destructive than a  
light cruiser's!



Douglas SBD Dauntless —  
the backbone of the Navy's  
air strikes during World War II.  
More than 5000 produced!



Douglas TBD-1 Devastator —  
the first modern torpedo monoplane;  
saw action at Midway!

Douglas "DT" — the first of  
nearly 12,000 Douglas  
planes built for the Navy!



## Douglas refined 40 years of experience into versatile Navy Skyhawk

The new Douglas A4D-5 Skyhawk — a powerful ace-of-all-trades for the Navy — is the result of the same imaginative engineering that has brought Douglas to the forefront in commercial aviation and the push into outer space.



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# airlift

WORLD AIR TRANSPORTATION

## FEATURES

Convair Sees 150 SSTs by 1970-75 .....	19
32 Strikes Cost the Airlines \$150 Million .....	22
After 32 Years, Court Says 'Split' .....	23
What TCA Wants In U.S. Bilateral .....	24
Rome's Leonardo da Vinci Airport .....	29
France's New Orly Terminal .....	30
Train Your Own Airline Execs .....	33
FAA Tests Explore How Old Is Too Old for Pilots ...	39

## THE INDUSTRY IN BRIEF

Air Transport Trends .....	15
Industry at a Glance .....	17

## STATISTICS

On-Time Boxscore .....	42
How's Traffic? .....	44
U.S. Airline Traffic for January .....	44

## ENGINEERING

Electra Changes Lift Speed Limit .....	49
--	----

## ELECTRONICS

RCA Aims for Altitude Provision in Transponders .....	53
---	----

## AIRPORTS

New Equipment Keeps Runways Clear .....	58
---	----

## MAINTENANCE/OVERHAUL

Structural Steel and Grip Floors Featured in TWA Docks ..	63
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## DEPARTMENTS

Personal View ...	9	News Briefs .....	60
Letters .....	11	FAA Report .....	62
Calendar .....	12	Maintenance/Over-	
Technically Speaking	41	haul Equipment.	66
Pilot Talk .....	54	Info for the Asking	68
About People ....	57	En Route .....	70

**THIS MONTH'S COVER**—A dramatic view from inside the terminal of Rome's new Leonardo da Vinci airport. Within the short span of a few weeks it recently joined Paris' Orly airport in unveiling to international travelers two of the most striking new terminals to grace the air transport scene. For special reports by Wayne W. Parrish and Phil Geraci, see pages 29-31.

Photo courtesy TWA.

20,250 copies this issue



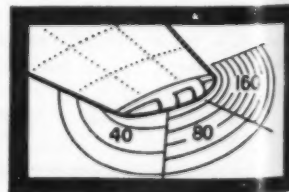
## Now... Mid-air collision danger ca

**"Flight 507 . . . You are cleared to enter traffic for runway 36 . . . You are number four to land . . . Report on downwind."**

This cockpit view shows a busy airport traffic pattern made safe because the pilot can see all aircraft in traffic, their direction of flight, relative range, attitude and projected flight path. This, because all planes shown are equipped with the new Honeywell-Atkins Maximum Safety Light System.

CAB records show that over 80% of the mid-air collisions and near-collisions occur within the vicinity of airports. Modern high-speed aircraft must be equipped with bright enough lighting to be seen under daylight restricted visibility conditions as well as at twilight and night. The

information seen by the pilot should tell him: Where is the other aircraft? . . . Which way is he going? . . . What is he doing? . . . What must be done to avoid him and how soon? This information, generated by the Honeywell-Atkins Light, promotes flight path planning instead of last-minute, violent evasive action. This high-intensity, xenon strobe lighting system flashes into the zone ahead at a rate of 160 flashes per minute, to the sides at 80 per minute and to the rear at 40 per minute.





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The location of the lighting systems in the aircraft wing-tips automatically provides attitude and ranging information.

Existing lighting equipment need not be altered or removed, this lighting system is compatible with it. The Honeywell-Atkins Maximum Safety Light has been proven on numerous flight evaluations, is approved by the FAA and is now in service on many military, corporate and commercial aircraft. For more information, contact your local Honeywell representative, or write Honeywell, Aeronautical Division, 2600 Ridgway Road, Minneapolis 40, Minnesota. Sales and service offices in principal cities throughout the world.

Honeywell-Atkins



# Honeywell

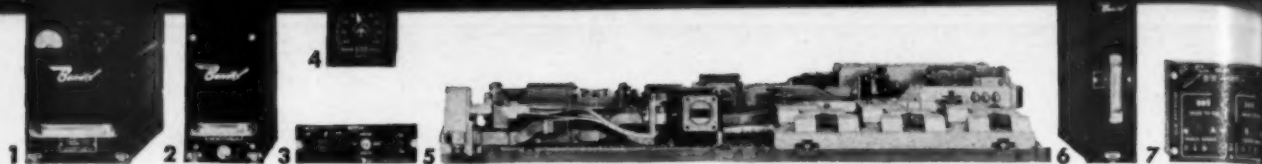


*Military Products Group*

IFT

APRIL, 1961

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Bendix Doppler System above weighs only 95 pounds. (1) Tracker Unit; (2) Transmitter-Receiver; (3) Control Unit; (4) Indicator; (5) Antenna; (6) Computer; (7) Control Unit

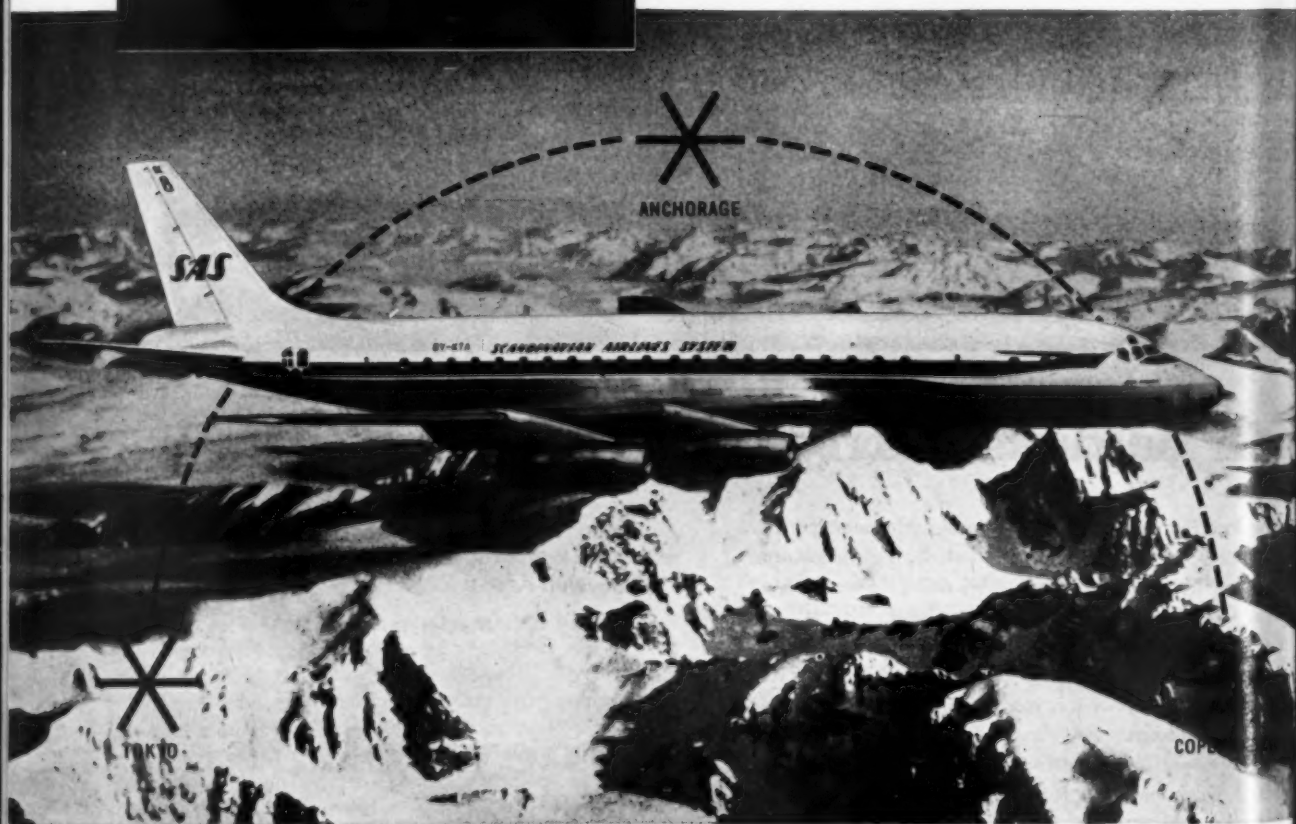
another major airline—  
**SAS**  
 chooses Bendix®  
 Doppler Radar

### Evaluation tests, on rugged transpolar route, show system's accuracy and reliability

After their tests on Copenhagen-Anchorage-Tokyo flights, Scandinavian Airlines System ordered Bendix® Doppler Radar Navigation Systems for its DC-8's and Convair 990's in polar and transatlantic service.

SAS thus joins a growing list of leading airlines that depend on reliable Bendix Doppler to provide accurate, continuous ground speed, drift angle, course and distance information. These airlines also find operational efficiency increased because in-flight time and fuel consumption are decreased.

Light in weight, the system is completely transistorized (except for the transmitting klystron). Maintenance is simplified by plug-in computer circuit boards and sub-chassis construction. And most important, only a single antenna is required for dual system operation. There are many other reasons for Bendix Doppler Radar leadership. For complete details, write . . .



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## The Cargo Solution: The Right Airplane

**W**HAT'S the matter with air cargo?

After all of the push, promotion, talking and forecasting of the past quarter century, only *five hundredths of one per cent* of the total inter-city ton-miles of all commercial traffic in the U.S. is moving by air.

There is scarcely a man in aviation who doesn't believe in the potential of the air cargo market. Yet the results to date have been far short of expectations.

Many reasons are given by the true believers for the absence of anything except a slow growth trend but those advanced by Emery Johnson, president of Air Cargo, Inc., appeal to us as sound and reasonable. In a New York speech recently, Johnson took a close look at fundamentals.

Fifty-one years after the Wright brothers' first flight and thirty-one years after the beginnings of commercial air transportation, we in aviation stand unique, he pointed out. In every other form of transportation, different kinds of vehicles have been developed for freight and passengers. Not so in ours. We are alone in this regard.

Cargo-carrying airplanes, with the exception of a couple of models being built abroad, have been nothing but makeshifts. DC-3 floors were "beefed up." DC-4s, DC-7s and 1649s have been similarly "converted."

But freight cars and trucks are not converted passenger vehicles, they were designed and built for freight. Yet both freight cars and trucks developed from their respective passenger origins.

Mr. Johnson warns that because of military leadership and military requirements, there is a trend toward bigness of airlift equipment which may throw the future of commercial air cargo more off the track than ever. Bulk moving between a few high-density points is not the solution. Bigger and bigger airplanes may reduce the ton-mile cost, but if the loads are not available, the reduction of unit cost is meaningless.

It is time to stop trying to mate military and commercial requirements—the twain shall never meet. American industry has decentralized to an astonishing degree in the past several decades. There are 54,000 communities representing the commercial manufacturing and distribution system. CAB Chairman Alan Boyd has already called for more consideration to regional airports serving multiple communities instead of trying to serve each and every one. Into this system fits the commercial cargo airplane.

Mr. Johnson may be scoffed at for suggesting that commercial interests must develop their own cargo airplane for the national cargo market, but isn't he basically right as rain? And isn't it time that the industry began with fundamentals instead of going off on tangents? And isn't there a govern-

ment agency available to take the leadership in fostering design awards or guaranteed loans or some such medium to get a cargo plane off the ground?

The market? The arithmetic remains the same as when earlier forecasts were made. All of the inter-city ton-miles moving in the air today could be carried in only twenty proper cargo aircraft. But if the penetration of the market would move from the present .05% to .5%, some 200 aircraft would be needed. And if air cargo should come into its own and move 5% of the total intercity ton-miles, then 2,000 such aircraft would be usefully employed.

The challenge remains. We need a proper commercial cargo airplane. Forget military participation for the moment. Surely there are sufficient resources in industry and government to start with the fundamental base on which air cargo can really develop—the right equipment.

### Air Union a Bust?

**S**EVERAL years ago a grandiose scheme was proposed in Europe to meld a group of airlines into a kind of consortium called Air Union. This was to be a sort of single airline over-riding national identities and effecting economies by joint operations and sales and to offer a unified front against competition, especially that of the U.S.

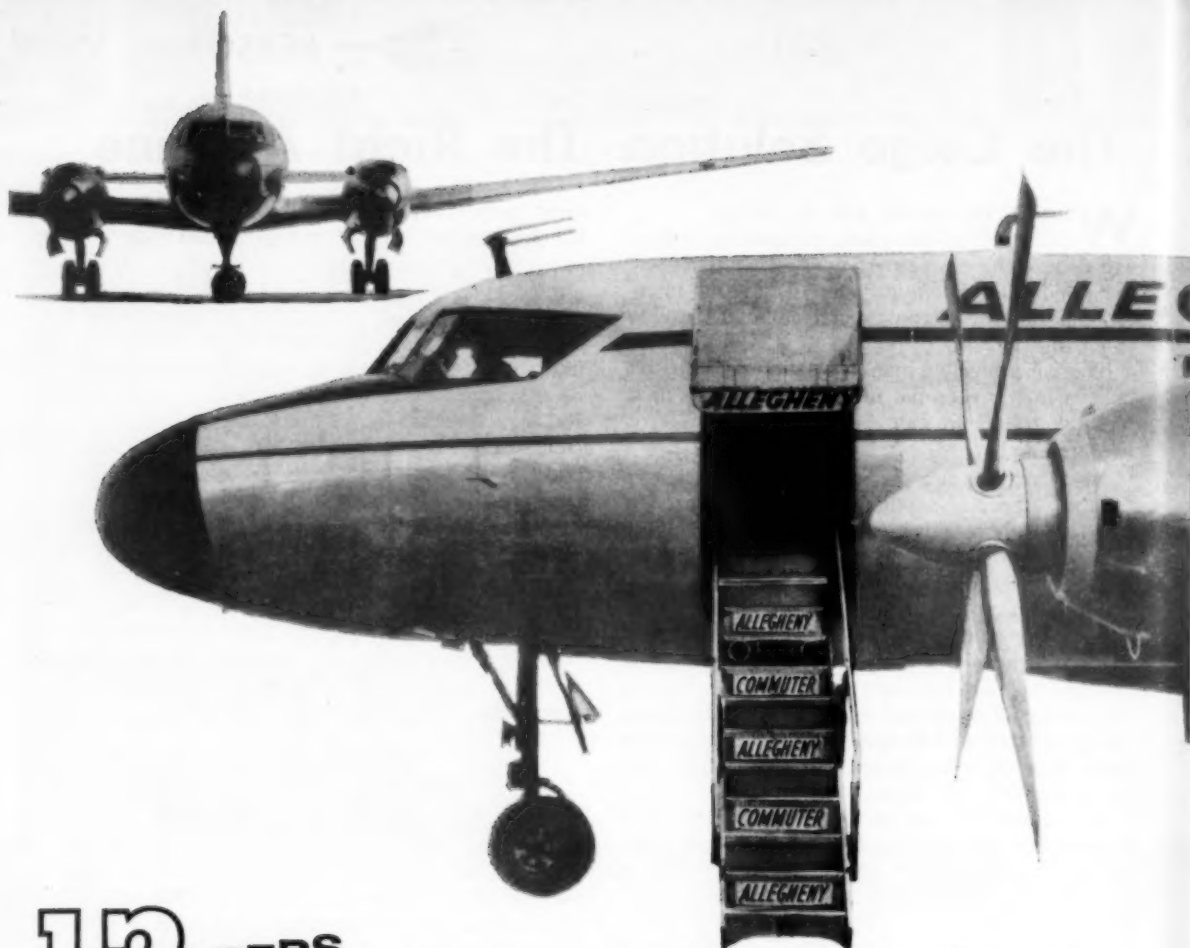
Initially Air Union was to be composed of five airlines, but KLM, the Dutch airline, balked at the allocations reserved for it and withdrew. So Air France, which led the movement to start with, joined up with Sabena, Lufthansa and Alitalia, to set up a workable organization.

But after many meetings and conferences, Air Union is a long way from coming into being, and there is now a very strong likelihood that it will never come to pass in the manner the designers envisioned. At the moment it may be headed for a major bust.

From the outset we thought Air Union was a dream quite detached from the realities of European politics, national aspirations and rivalries, and plain common sense. There was no single economic driving force which made an Air Union imperative above all of the diverse other interests of culture, finances, government controls and individualities of managements. It was far too ambitious, and needlessly so.

Consortiums designed to be protective, i.e., originating from a negative base, are usually not successful. And Air Union lacked the kind of

*Continued on page 11*



# 12<sup>STEPS</sup> TO MORE PROFITS!

**FOR PASSENGERS.** THE CANADAIR/CONVAIR 540 saves time in commuter travel. Napier Eland jet-powered speed extends effective territory. Smooth, vibrationless flight and a spacious, comfortably pressurized cabin permit work or planning without travel tension. Convenient carry-on baggage racks and built-in air stairs shorten terminal-to-takeoff and touchdown-to-taxicab times. And to the business traveler, time is money.

**FOR OPERATORS.** THE CANADAIR/CONVAIR 540 increases productivity per fleet unit. Optional seating capacities of 52, 60 and 72, and airline-reported direct operating costs as low as 89¢ per mile expand earning power. With full-payload range up to 815 miles, cruising speed up to 327 mph, and intermediate stops possible in less than 10 minutes, the 540 does more work for its operator than any comparable transport. And satisfied passengers become repeat customers.

Jet power for the Canadair/Convair 540 is the 3500 ehp Napier Eland turboprop, designed and built for local service air transport by manufacturers with a tradition of more than 150 years of engineering leadership. World-wide parts and service support is provided by Napier, and Canadair, Ltd., a subsidiary of the General Dynamics Corporation. Now in regular service in North America with ALLEGHENY AIRLINES, INC., QUEBECAIR, INC., and the ROYAL CANADIAN AIR FORCE.



**-NAPIER-**  
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Continued from page 9

affirmative goal needed for success.

The origin of Scandinavian Airlines System, for example, was quite different. Here were three small countries: Sweden, Norway and Denmark, —all with traditions of international interests but each too small to support its own worldwide airline service. Each realized that a joint effort and a natural regional identification, could become a major factor in world air transportation.

But even with all of the favorable circumstances inherent in the SAS consortium, the Scandinavian project has had tough sledding at times, especially with the loss of the dynamic leadership which got it underway.

So it stood to reason that Air Union would have an even rougher time coming into being.

There are signs that it is falling apart at the seams even before the proposal reaches the various governments for formal approval. If anything remains of the dream it will be some sort of joint working agreement along the lines of the British Commonwealth group which looms as the largest, most powerful and most dominant airline combination in the world. Where Air Union was negative and protective, the Commonwealth group through interline and political machinery has become exceedingly aggressive and is bound to control a vast portion of the world's airline traffic.

Wayne W. Parrish



## LETTERS

### Bargain Fares

To the Editor:

I have just read your editorial "Bargain Fares With Pistons," and can only say it's about time. My congratulations to TWA for taking this step in the so-called jet era.

Immediately I see three good reasons for this type of service; untapped revenues from the surface traveling public, continued employment for possible future furloughed flight crews and ground personnel and use of equipment that has shown poor resale on the used aircraft market.

Future profits from this type of service can also be used to offset the losses sustained in the high cost of operations of the pure jet aircraft.

Good service to passengers, either jet or piston, is still good publicity for any airline.

D. Bartholomew, FAA  
Los Angeles, California

### In Defense of Rome

To the Editor:

You are correct in saying that Rome/Ciampino was "bedlam," but it is neither correct nor fair to say that "nobody has ever given so much as one minute of silent thought about trying to organize the merger facilities at hand."

The Rome Airline Operators Committee is a most active and productive body, and for the past several years we have made great efforts to rectify the deficiencies at Ciampino, including those you mention.

We were not always successful, and the lack of signs was one of our more glaring failures. You must bear in mind that (1) civil aviation is a branch of the Italian Air Force, and the authorities with whom we have to deal are not always sympathetic with passenger handling problems; (2) we did achieve some noteworthy improvements in the physical facilities, and (3) many of our efforts have borne fruit only in the planning and eventual completion of the new Fiumicino airport.

Samples: signs at every gate, multiple

police gates, "Only system" for customs examinations, close-in parking of big jets, adequate check-in counters, etc.

These may not strike you as remarkably modern innovations, but each one was the result of long, hard work by the A.O.C.

As former chairman of the A.O.C. I must rise to defense of my colleagues from all the 40 airlines operating into Rome, and also invite you to see the vast improvements the A.O.C. has achieved at the new Fiumicino Airport.

Under our new and most capable chairman, Bill Chambers of TWA, we are constantly working with the Italian authorities to improve passenger handling facilities and procedures, and to overcome the natural tendency toward confusion which you mention.

ANTHONY J. KING  
Airport Manager  
Pan American Airways  
Fiumicino—Rome, Italy

**Ed. note:** See article on new Rome airport in this issue. WWP visited Fiumicino Feb. 22 before the above letter arrived, and was escorted around by S. W. Chambers.

### Supersonic Rebuttal

To the Editor:

In your issue for December, 1960, you published a press release on supersonic transports attributed to me and a critique of this release by Mr. William Littlewood of American Airlines. I would appreciate the opportunity of replying to several of Mr. Littlewood's comments.

First, I certainly do not believe that the supersonic transport is a fantasy. It is a feasible engineering conception which will undoubtedly come, although not for some years.

I assume that Mr. Littlewood is familiar with the difference between block speeds and cruising speeds, although his comments on what he calls my "numerical contradictions" about a supersonic trip from Sydney to London would suggest that he is not.

If Mr. Littlewood has not yet made a detailed study of the application of a supersonic airplane to his company's operations then I feel sure he has a surprise coming. We have done these studies and have established realistic terminal to terminal block times for the Mach 3 transport by the same methods that we use now in scheduling our services. These route studies clearly show that on our routes, with average block distances over 2000 miles, the Mach 3 supersonic transport will only have block speeds between 1200 and 1500 mph, and an average block speed below 1300 mph.

On the question of cabin windows I feel that it behooves the airlines and the manufacturers not to reach the conclusion hastily that windows are the only solution to the undoubted problem of claustrophobia, of which we are well aware.

The environment of windows in supersonic aircraft is such that they must inevitably be of a vitreous material. The troublesome experience of the world's airlines with glass cockpit windows in subsonic jets (which operate under comparatively modest conditions of temperature and stress) does not encourage me to believe that it will be easy or cheap to develop windows of the required integrity for the supersonic transport at an acceptable weight.

Claustrophobia is a psychological problem and I believe there may well be an alternative psychological solution based on appropriate interior design to give a "space illusion." Even now we operate some of our Boeing 707 night sectors with the admirable Boeing type sliding shades fully drawn before the passengers board the aircraft. This has produced no problems.

In any case, whatever the ultimate decision on windows may be, I feel that television may play a useful part in giving the passengers the psychological environment they desire in the supersonic transport. Although the scene shown by a television camera scanning from a position below the aircraft may not be ideal, it will certainly be vastly better than anything the passenger will be able to see through a small window lying immediately above an enormous slab wing.

On one point I agree with Mr. Littlewood. We, too, want to wait for "the type of supersonic aircraft which is economically feasible and which is the kind of machine conservative transport operators



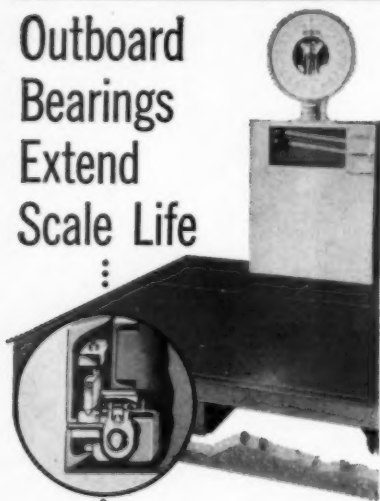
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would wish to submit with confidence to the traveling public."

Qantas is a conservative airline. But we express our conservatism by an intensive study of the technology of new developments, so that we may identify the problems of the future and face them realistically. I believe that the development of an economically feasible and operationally satisfactory supersonic transport will depend on airline contributions to the concept to a degree far beyond anything we have experienced in the past.

C. O. TURNER  
Qantas Empire Airways, Ltd.  
Sydney, Australia

#### Interest in 'On-Time'

To the Editor:

From time to time *AIRLIFT* publishes performance records of all mainland airlines relative to their on-time performance. While neither Hawaiian nor Aloha submits these records to the Civil Aeronautics Board it is possible for us to check our own performance against the industry by recap of our own records. I thought you might be interested in the results of our comparison.

Listed below are the carriers' rankings for August 1960—perhaps the fairest month, when mainland weather is universally good and Hawaiian's loads are operating at peak levels. Comparison may be considered slightly unfavorable as our record encompasses all flights, whereas the on-time performance for the mainland carriers reflects only non-stop and one-stop trips. The ranking follows:

1	West Coast	97.6
2	Central	96.4
3	Piedmont	93.0
4	Frontier	87.7
5	Hawaiian	87.2
6	Western	86.5
7	Lake Central	85.8
8	Braniff	83.8
9	Continental	82.0
10	Ozark	81.7
11	Trans World	80.8
12	United	80.5
13	Pacific	77.4
14	North Central	75.8
15	Trans-Texas	74.7
16	Southern	74.2
17	American	74.1
18	Capital	72.1
19	Allegheny	70.7
20	Bonanza	69.5
21	Eastern	68.3
22	Northeast	64.6
23	Delta	64.1
24	Northwest	61.5
25	Mohawk	59.6
26	National	47.4

D. PATRICK RILEY  
Hawaiian Airlines  
Honolulu, Hawaii

#### BOOKS

"Instrument Approach and Landing," a special issue of *The IRE Transactions*, has been reprinted and is being offered to the aviation public at \$4.50 (\$2.25 for IRE members). Originally issued in June, 1959, this Institute of Radio Engineers' Professional Group on Aeronautical and Navigational Electronics publication covers many facets of instrument operation from early experiments in 1928 to the present.

Guest editor Frank B. Brady is Washington representative for General Precision Equipment Corp. He was assisted in the project by E. A. Post, a previous *Transactions* editor and currently with Stanford Research, Inc.

Copies may be obtained by addressing: The Institute of Radio Engineers, 1 East 79 Street, New York 21, New York.

#### Noise Movie

ATA has a 13-minute, 16mm sound movie on jet noise entitled "Sound Progress" available for loan to airport managements. Requests should be made through regional ATA offices.

#### COMING

##### April

- Apr. 4-7—SAE, national aeronautic meeting, Commodore Hotel, New York.
- Apr. 7—Air Freight Forwarders Assn., annual dinner, Waldorf Astoria Hotel, New York.
- Apr. 8-14—International Aviation Exposition and Flying Display, Singapore Airport.
- Apr. 10—IATA, TC2 agency committee, Paris.
- Apr. 10-14—FAA, bureau of research & development, 1st annual international symposium on aviation research & development, Haddon Hall, Atlantic City, N.J.
- Apr. 13-14—National Aeronautical Services Assn., annual meeting, Hotel Washington, Wash., D.C.
- Apr. 14-16—ATA, stores & material planning committee, Queen Elizabeth Hotel, Montreal, Canada.
- Apr. 15-30—International Society of Aviation Writers, international aeronautical exposition, Bogota, Colombia.
- Apr. 17—IATA, 14th technical conference and supersonic transport symposium, Queen Elizabeth Hotel, Montreal.
- Apr. 18—IATA, legal committee, Paris.
- Apr. 18-20—AEEC, airlines electronic maintenance meeting, Dinkler-Plaza Hotel, Atlanta.
- Apr. 18-28—ICAO, air traffic conference, Sheraton-Blackstone Hotel, Chicago.
- Apr. 18-28—ICAO, origin and destination statistics panel, third meeting, Paris.
- Apr. 22-25—AAAE, 34th annual business meeting and conference, Broadmoor Hotel, Colorado Springs, Colo.
- Apr. 24—IATA, ground handling advisory group, Montreal, Canada.
- Apr. 25—ICAO, personnel licensing/medical division, Montreal.
- Apr. 24-27—Aerospace Medical Assn., 32nd annual meeting, Palmer House, Chicago.
- Apr. 30-May 4—Instrument Society of America, 7th national aero-space instrument symposium, Adolphus Hotel, Dallas.

##### May

- May 1—IATA, clearing house and revenue accounting sub-committee, London.
- May 3-5—American Helicopter Society, 17th annual national forum, Sheraton-Park Hotel, Wash.
- May 7-12—Airport Operators Council annual membership meeting, Miami Beach.
- May 8-10—IRE, national aeronautical electronics conference, Miami & Dayton Biltmore Hotels, Dayton.
- May 10-12—American Society of Civil Engineers—Airport Operators Council, joint airport conference, Carillon Hotel, Miami Beach.
- May 17—IATA, financial committee, Montreal.
- May 22-24, IRE, 5th global communications symposium, Sherman Hotel, Chicago.
- May 24-26—Electronic Industries Assn., 37th annual convention, Chicago.
- May 31—IATA, executive committee, New York.

##### June

- Jun. 2-3—Reading Aviation Service, 12th national maintenance and operations meeting, Municipal Airport, Reading.
- Jun. 11-15—ASME, summer annual meeting, Statler Hilton, Los Angeles.
- Jun. 12-13—IRE, 3rd national symposium on radio frequency interference, Sheraton-Park Hotel, Washington, D.C.
- Jun. 13-14—Aviation Distributors & Mfrs. Assn., 37th meeting, Dennis Hotel, Atlantic City, New Jersey.
- Jun. 13-16—IAS, summer meeting, Los Angeles.
- Jun. 21-23—Airlines Electronics Engineering Committee, general meeting, Hotel Saxony, Miami Beach.
- Jun. 28-July 1—The Institute of Navigation, annual meeting, Williamsburg Inn, Williamsburg, Va.



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# AIR TRANSPORT TRENDS



## Equipment

**Douglas has a new medium jet transport proposal.** It would use four jets contained in the rear of the fuselage, rocket-like rather than in pods. This is the Douglas answer to the Boeing 727, but it is still very much a paper aircraft.

**Vickers VC-11 project is in trouble.** Trans-Canada originally was very interested, but now won't order unless other customers do so. And Vickers won't firm up the specs until it gets more customers. Meanwhile, time is running out on TCA which is now investigating the Convair 990 as its medium jet. But no decision is likely to be made for some time.

## Helicopters

**Breakthrough is coming in rotor safety.** Sikorsky has perfected a system of pressurizing the main rotor spars for crack detection. A direct reading gauge would give pilot advance warning of cracks. Sikorsky officials recently gave CAB and its staff a private presentation of the safety advance.

## Schedules

**How not to run an airline.** One regional trunk airline has had 17 schedule changes since December 15.

## Stores/Supply

**Watch for two major developments in this area.** Airlines have stepped up their activity toward: (1) Central purchasing of common items, such as ground support equipment; (2) Pooling of spare parts in domestic U.S. operations similar to the highly successful plan now employed by U.S. and foreign flag airlines (*AIRLIFT*, Dec.).

## Service

**Airlines are getting increasingly more conscious of "on time" records.** Some have created special staff organizations to ferret out controllable delay causes and correct them. Monthly statistics are being examined critically even to the extent of questioning the claims of their competitors when extraordinary shifts in the rankings occur. (See on-time boxscore, page 42).

## Taxes

**U.S. treasury outgains the airlines \$4 to 30¢ on every passenger.** This was the comparative result in 1960 of transportation tax income versus airline profit per passenger carried.

## Cargo

**Airline cargo terminal projects continue to meet setbacks.** Big project at Pan American is back on the shelf, temporarily. Pan Am's board of directors deferred action for a reason not peculiar to PAA—money. At American, the high cost of its Detroit Metropolitan airport facility (\$40 per sq. ft.) ground its terminal planning to a halt.

## Growth

**Example of industry growth:** Two trunks are aiming this year for total revenues of more than half a billion dollars each. United, following Capital merger, will be looking for 1961 gross of \$575 million. American's goal is \$500.1 million. Only 11 years ago, entire trunk industry had just nudged over the half billion mark.

# JT8D-1

**THE POWER FOR  
BOEING'S NEW  
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RIBBON ANCESTRY**



The JT8D-1 is the latest Pratt & Whitney Aircraft commercial turbofan engine. Many of its characteristics come from other proven Pratt & Whitney Aircraft jet engines.

The JT8D-1 utilizes the same design philosophy and basic technology of the jet engines which have more than 12 million hours of performance and reliability to their credit. Also from these proven engines, the JT8D-1 inherits a sound, sophisticated jet design. And from the JT-3D turbofan, which powers the fan versions of the Boeing and Douglas Jets, comes the essential design for the fan structure of the JT8D-1.

Eastern Air Lines and United Air Lines have each ordered this latest turbofan engine for their new Boeing 727's. Turning out 14,000 pounds of take-off thrust, the JT8D-1 helps make it possible to operate efficiently from runways that used to be too short for modern jet travel. Now additional cities coast-to-coast will be connected to the rest of the world by jet.



**UNITED AIRCRAFT CORPORATION**  
**Pratt & Whitney Aircraft Division**

East Hartford, Connecticut

# INDUSTRY AT A GLANCE



## EQUIPMENT

**Lockheed gets cargo plane nod**—The Air Force's much-coveted contract to build the SS476L "optimum" civil/military cargo jet is going to Lockheed's Georgia Division. It won a hotly contested design competition with the three other transport giants—Douglas, Convair and Boeing—reportedly with a substantially lower cost proposal. The program involves more than 100 aircraft and eventually is expected to go well beyond \$1 billion in funding, exclusive of any civil orders it might inspire. First operational aircraft (see photo, page 60) is due in fiscal 1965.

## INTERNATIONAL

**Cargo airbus proposed**—Seaboard & Western Airlines, soon to become Seaboard World Airlines, has asked the U.S. Civil Aeronautics Board to endorse an experiment under which it would carry passengers at bargain basement levels on daily CL-44 turboprop cargo flights between New York and Europe.

S&W proposes rates 44% lower than present transatlantic economy fares—such as \$133 to London, \$137.25 to Paris and \$145.80 to Frankfurt. Fares would be based on 3.8¢ per mile. Baggage allowance would be 66 lbs. No meals would be served and no reservations accepted more than six hours in advance of departure. Seats would be pre-mounted on pallets and located in space not utilized by mail or cargo.

## ROUTES

**Strength for National**—The long-awaited "last plum" of a six-year long CAB program to strengthen the regional trunk airlines was awarded to National Airlines in the form of a Florida-to-California southern transcontinental route.

To Delta Air Lines went second prize, a basic Atlanta to west coast route with the authority to originate in Florida at Jacksonville and Orlando as a transcontinental nonstop. Eastern was granted Dallas/Ft. Worth to Miami authority and both American and Continental received new Texas-California routes.

For the big winners, National and Delta, CAB estimated the new routes would mean \$41.5 million and \$30 million in additional annual revenues. As an immediate reaction to the award, National said it will purchase six new jets. Delta had testified earlier in the case that its needs would increase by

eight aircraft. All carriers presumably will start services on June 11.

## INDUSTRY

**Time for reappraisal**—The new administration in the U.S. and its aviation head Najeeb E. Halaby are wasting no time taking inventory of the job ahead.

As the first step, the President named Fred M. Glass to head "Project Horizon," a task force chartered with the responsibility of setting aviation's goals for the next decade. It will report in 90 to 120 days. Glass, who has a wide background of experience in airlines, CAB, cargo and airport administration, is no newcomer to federal committee activity, having served on the earlier Harding committee aviation study and on last year's Reed committee study of MATS.

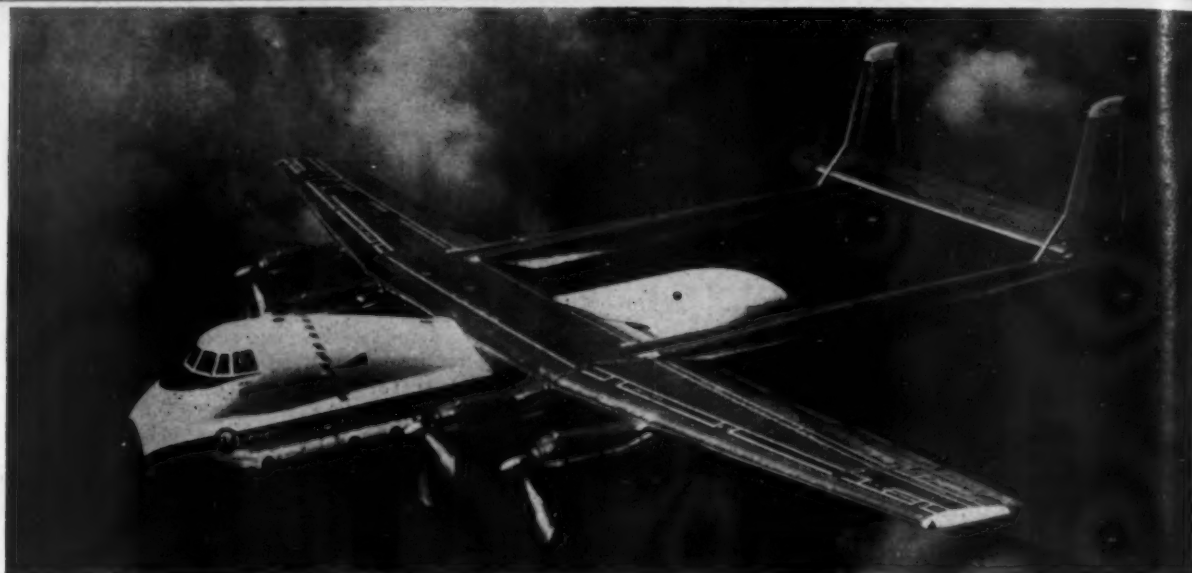
Another task force, named by Halaby, will undertake a scientific review of the R&D aspects of the U.S. airways and aviation system to determine if the FAA's present "black box" program is the right one.

## MANAGEMENT

**TWA gets a president**—On April 17, almost nine months since Charles S. Thomas left the job, the "vacancy" sign comes off the door of the president's office at TWA. Charles C. Tillinghast, Jr., former vice president of foreign investments and plants for Bendix Corp., on that day will take over as TWA president, chief executive officer and director.

Tillinghast, who is 50, enjoys one advantage over his short-term predecessors in managing TWA. For the first time since 1938, the head of the airline will not be dealing with the will o' the wisp policies of an unpredictable Howard Hughes but, instead, with a three-man trusteeship which has been given a free rein to plot the carrier's future financial flight plan.

**Merger afoot**—Riddle Airlines and Aerovias Sud Americana have agreed to merge, subject to CAB approval. Combined networks would provide cargo service from New York and Chicago to Panama and Peru. Aerovias, a scheduled U.S. international all-cargo airline formed in 1947, has two DC-6s, two DC-4s and a C-46. Its principal operation is the West Coast-Patrick AFB missile run, although the Riddle merger is expected to revitalize its South American cargo operation through the stronger sales effort it makes possible.



## AIRWORK TO OVERHAUL DART ENGINES ON RIDDLE AIRLINE'S NEW ARGOSY FLEET

*world's largest all-cargo carrier will get 21-day  
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To get the fast, economical, dependable performance demanded by their MATS contract, Riddle Airlines has replaced C-46's with 300 mph Rolls-Royce powered Argosies. To make sure they keep getting this high level performance, the Argosy's engine and accessory overhauls will be done by Airwork.

Airwork will provide 21-day turnaround service . . . some of the most modern Dart overhaul and test equip-

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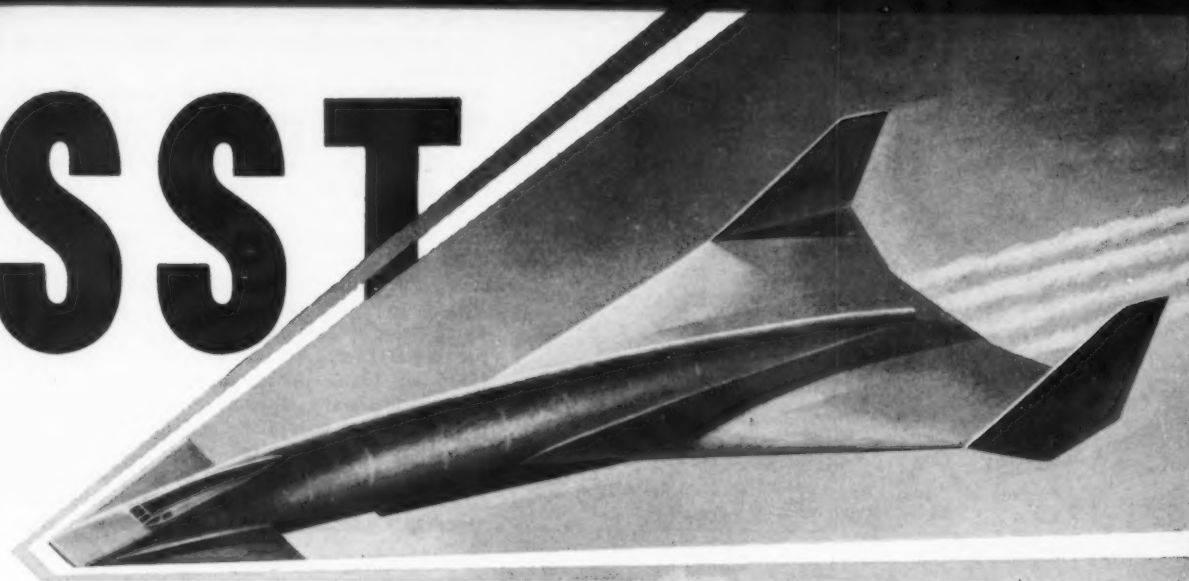
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DART ENGINES

# SST



## Convair Sees 150 SSTs by 1970-75

By JOSEPH S. MURPHY

**T**HE SUPERSONIC TRANSPORT is not only feasible from a technical standpoint, but come 1970 it could produce a profit for airlines down to a 50% load factor.

This, briefly, is the outlook of an extensive market research study completed by Convair Division of General Dynamics. Convair also concludes that the aircraft could be introduced by 1970 and would offer real service advantages. It could span the U.S. in the time a DC-3 flies from New York to Washington. A westbound round-the-world SST could depart Los Angeles at 6 p.m. and arrive the next day at 4 p.m. without a takeoff later than 10 p.m. from any of the five major cities enroute.

The big SST problem as Convair sees it lies in finance . . . how to get the program started. Due to the risks involved, over \$500 million before the first airplane is delivered, and the expected slow production and delivery sched-

ules, the rate of return offers little attraction to private capital. It looks like government financing will be a must for the R&D phase.

Here's how Convair looks at other SST aspects:

**Range**—The free world market will be served best by an SST with a 4000-mile design range. Only one design should be built at first to operate at all ranges. It would be uneconomical to build both a short/medium and a long-range aircraft.

**Size**—Expected traffic volumes and flight frequencies call for an airplane of at least 100 to 125 passengers. Based on economics, a 70-passenger model would be a loser even at design ranges. A 100-passenger aircraft would return only a small profit at off-design stage lengths. The 130-passenger SST would be a moneymaker down to 1000 miles and compares favorably with present-day jets.

Although an aircraft with more than 130 seats would have better operating costs, the size, weight and large num-

### Potential Supersonic Aircraft Required

Mach No.	70 Passenger Aircraft	100 Passenger Aircraft	130 Passenger Aircraft
	1965		
2.0	199	141	108
2.5	171	121	93
3.0	154	109	83
3.5	143	101	77
	1970		
2.0	276	195	149
2.5	237	168	128
3.0	213	150	115
3.5	198	140	107
	1975		
2.0	346	245	187
2.5	298	211	161
3.0	267	189	145
3.5	249	176	135

### Construction Materials for Supersonics

ITEM	ALUMINUM	STEEL—TITANIUM
Material Cost	Low	Expensive
Fabrication Cost	Moderate (sandwich)	See Note
Fabrication Techniques	Established	Improving
Speed Capability	M 2.2 to 2.4	M 3.9
Weight	High near Speed Limit	Moderate
Durability	Unproved above M 2.0	Long Life
Maintenance	Relatively Uncomplicated	Dependent on Fabrication Techniques

Note: Very high if welded sandwich. New concepts indicate low fabrication costs are feasible, however.

## —How Price Affects Costs and Profit—

Item	Original Price	50% Increase
Basic Price	\$11.9 Million	\$18.0 Million
Total Price (Incl. Eng. & Radio)	14.1 Million	20.2 Million
Investment (145 A/C)	2.04 Billion	2.93 Billion

### Costs Affected by Aircraft Price

Cost Per Flying Hour		
Insurance	\$187.53	\$268.86
Material—Aircraft	99.78	149.19
Depreciation—Aircraft	336.77	509.40
Aircraft Spares	33.60	50.68
Maintenance Burden (A/C Portion Only)	11.29	16.98
Sub-Total: Costs Affected by A/C Price	\$668.97	\$995.11
Costs Unaffected by A/C Price	2,071.63	2,071.63
Total Operating Cost per Hour	2,740.60	3,066.74
Direct Operating Cost per A/C Mile	1.68	1.88
Return on Investment per Year	46%	25%

CONVAIR ESTIMATES show how 50% price hike affects airline operating costs and return on investment. It assumes a Mach 3 airplane with 4000-mile range, 130 passengers and 20% profit for single-source supplier.

### Direct Operating Costs

#### One Manufacturer—20% Profit

##### Cents Per Statute Seat Mile

##### 4,000 St.M. On Design

	70 PASS.	100 PASS.	130 PASS.
M 2.0	2.24¢	1.69¢	1.37¢
2.5	2.01	1.52	1.26
3.0	1.90	1.49	1.29
3.5	2.71	2.05	1.73

##### M 3.0—4,000 St.M. Off Design<sup>1</sup>

100 Pass.	1.49¢	1.57¢	1.89¢
130 Pass.	1.29	1.40	1.67

##### Cents Per Statute Seat Mile

##### Other Aircraft

	2,300 St.M	1,150 St.M
DC-7B	1.82¢	1.89¢
CV-880	1.35	1.40

<sup>1</sup> Off design is the ability of an aircraft designed for a specific range (in this case, 4,000 St.M.) to operate above and below the design range. Since operation above design range means drastic payload reduction, we have investigated the 4,000 St.M. design operating at 2,300 St.M. and 1,150 St.M.

HOW SST COSTS shape up for varying speeds and passenger capacities. Note comparison with present aircraft.

ber of engines mitigate against airport economics and route flexibility.

**Speed**—With some slight qualification, there is no clear advantage in operation or economics for any design cruise speed from Mach 2 to Mach 3. This assumes all aircraft would attain an operating life of 30,000 hrs. Below 20,000 hrs., all would be unprofitable. Beyond Mach 3, the Mach 3.5 SST is limited by the engines used, although future engine developments could produce good economics at Mach 3.5 and faster.

Speeds up to Mach 4 will satisfy the world's major markets as to travel time just as well as aircraft capable of flying twice as fast. Beyond Mach 4, the frontier for improving SSTs lies in reduction of their operating costs.

**Operating Costs**—Although the costs of building an SST are still uncertain, an increase of 50% would raise direct operating costs only 12% and the airline's rate of return would drop from 46% to 25%. Airframe, engine and crew costs would be relatively stable, but fuel costs—which will represent more than 50% of total direct costs—offer tremendously greater potential for improvement.

### New thinking on utilization

Contrary to earlier expectations, the supersonic transport is not overly sensitive to utilization. Direct costs rise appreciably only when utilization drops below 1800 hours per year or about five hours per day.

**The Market**—Airlines should be able to use 150 SSTs in the 1970 to 1975 period and these should penetrate about 60% of the traffic over segments exceeding 1000 miles. Like any future transport, the SST must be capable of use in coach markets.

**Program Costs**—The SST is ideally a one-manufacturer program. With a single source, the price would be \$14.1 million, less spares. With two manufacturers in the business, the pricetag becomes \$17.4 million and with three it jumps to \$20.1 million. If the price climbs above \$23 million, the economics of an SST become unfavorable to the airlines.

**Financing**—Five major U.S. airlines (the Big Four and Pan Am) should require no additional financing to buy 30 SSTs and their spares by 1970.

As a basis for its conclusions, Convair studied a variety of SSTs cruising at speeds of Mach 2, 2.5, 3 and 3.5 and ranges of 1500, 2500 and 3500 nautical miles.

Its analysis of traffic trends for the years 1965-70-75 indicates that passenger miles flown over stages exceeding 1000 miles will grow from about 51 billion in 1965 to 72 billion in 1970 and 93 billion by 1975. U.S. domestic services will account for about 50%, the North Atlantic about 20%, the Orient 4% and the rest of the Free World about 25%.

Dividing forecasted traffic into specific mileage groups, Convair's analysis shows that four major markets would account for about 77% of total potential SST business by 1975. They are: Northeast U.S. to Florida (1000-1400 mi.) 24.6%; Northeast U.S. to Europe (3400-4000 mi.) 20.3%; Midwest U.S. to California (1600-2000 mi.) 16.4% and U.S. transcontinental (2400-3000 mi.) 15.7%.

### Why they don't agree

Convair's recommendation for a 100 to 125-seat SST varies from the 60-to-80 passengers proposed earlier by Lockheed for several reasons. At the time of its report (1959) Lockheed envisioned SSTs operating in full fleet strength by 1965, whereas Convair sees an early operation on high density prestige routes. Use on secondary routes would come as capacity justifies it.

Since it expects the 1975 long-haul market to be 80% above that of 1965, Convair feels the 60-80 seat SST would have to grow to 100-145 seats to satisfy the 1975 demand. Further, Convair's traffic outlook for 1975 (which

# SSTs Coast to Coast in U.S.

Begin in New York	M 2.0			M 2.5			M 3.0			M 3.5		
	Local Time	Util.		Local Time	Util.		Local Time	Util.		Local Time	Util.	
1. Leave New York	9:00 AM	—		9:00 AM	—		9:00 AM	—		9:00 AM	—	
2. Arrive West Coast	8:18 AM	2.3		7:54 AM	1.9		7:42 AM	1.7		7:36 AM	1.6	
3. Leave West Coast	9:18 AM	—		8:54 AM	—		8:42 AM	—		8:36 AM	—	
4. Arrive New York	2:36 PM	2.3		1:48 PM	1.9		1:24 PM	1.7		1:12 PM	1.6	
5. Leave New York	3:36 PM	—		2:48 PM	—		2:24 PM	—		2:12 PM	—	
6. Arrive West Coast	2:54 PM	2.3		1:42 PM	1.9		1:06 PM	1.7		12:48 PM	1.6	
7. Leave West Coast	3:45 PM	—		2:42 PM	—		2:06 PM	—		1:48 PM	—	
8. Arrive New York	9:12 PM	2.3		7:36 PM	1.9		6:48 PM	1.7		6:24 PM	1.6	
9. Leave New York	—	—		—	—		7:48 PM	—		7:24 PM	—	
10. Arrive West Coast	—	—		—	—		6:30 PM	1.7		6:00 PM	1.6	
11. Leave West Coast	—	—		—	—		7:30 PM	—		7:00 PM	—	
12. Arrive New York	—	—		—	—		12:12 AM	1.7		11:36 PM	1.6	
Totals		9.2			7.6			10.2			9.6	

MACH 3 SST could fly NY-LA nonstop, turn around in an hour and depart Los Angeles 18 minutes earlier than it left New York.

it considers conservative) is 50 billion passenger-miles higher than that of Lockheed.

Convair feels the number of nonstop roundtrips a week in major markets would threaten serious traffic congestion with a small aircraft. Using July 1, 1960 as a base, Convair estimates U.S. transcontinental flights will increase from 161 roundtrips a week to 282 in 1965 and 443 in 1975. New York to Florida roundtrips will grow from 91 last July to 159 a week by 1965 to 250 in 1975. New York to London flights will increase from 60 a week last year to 136 in '65 and 251 in '75.

Convair's conclusion: a 60-80 seat SST is too small for major markets even at 1960 levels. By 1975, the same will hold true for secondary markets.

In its study of speeds, Convair sees the built-in "stretch" offered by a steel or titanium SST as the factor that will probably dictate their selection. This would immediately preclude a market for an aluminum SST and the latter, if undertaken, could conceivably be obsolete even before it enters service.

## An exhaustive cost analysis

In approaching the economics of supersonics, Convair looked at 324 combinations of airplane configurations, profit levels for manufacturers and competitors for the business. The results showed that seat-mile costs would vary from a low of 1.29¢ per seat mile for a Mach 2.5, 130-passenger aircraft to 2.24¢ for a Mach 2, 70-passenger machine. This assumed a single manufacturer source at a 20% profit and a 4000-mile design range (see table).

Using the same ground rules, the Mach 2.5, 130-seat model would have a 46% breakeven load factor compared with 82% for the Mach 2, 70-passenger design. A 70-passenger, Mach 3.5 model would have costs of 2.71¢ per seat mile and require a 100% load factor to break even.

For a Mach 3 SST, the breakeven need would vary by

## Mach 3 SST Around the World

	City	Local Time
Leave	Los Angeles	6:00 PM
Arrive	Honolulu	5:42 PM
Leave	Honolulu	8:00 PM
Arrive	Tokyo	5:30 PM
Leave	Tokyo	7:00 PM
Arrive	Hong Kong	8:20 PM
Leave	Hong Kong	10:00 PM
Arrive	Karachi	8:00 PM
Leave	Karachi	9:30 PM
Arrive	London	6:30 PM
Leave	London	8:45 PM
Arrive	Los Angeles	4:00 PM

ROUND THE WORLD supersonic service permits departures at reasonable local times at all five intermediates.

stage length and seat capacity as follows: At 1150 miles the 100-passenger airplane would have a 69% breakeven load factor compared to 61% for a 130-seat model. At 2300 miles the figures become 58% and 51% respectively and at 4000 miles they drop to 55% and 47% respectively.

Based on 1975 traffic estimates, a single (but profitless) manufacturing source, the airlines have to invest anywhere from \$1.75 billion for 145 130-passenger Mach 3 SSTs up to \$2.77 billion for 346 70-

seat Mach 2 types. If speeds go to Mach 3.5, the cost of 249 70-seat aircraft soars to \$3.11 billion.

As a means of accelerating operating experience at supersonic speeds, Convair suggests a fleet of 12 B-58s fitted with P&W J58s could produce 2500 hrs. flight experience at speeds beyond Mach 1.5 by 1965 and 10,000 hrs. by mid-'67. Maximum cruise would be Mach 2.4.

Such a project would cost \$237 million. However, if a similar test program were operated with Mach 3 prototypes, Convair estimates the cost would exceed \$500 million and testing would be delayed five to seven years.

This is the Convair view of the market potential for an SST ten years hence. The details are particularly timely as engineers of the world's airlines and transport manufacturers prepare to meet in Montreal this month (April 17-21) for their first formal discussion of the techniques of making the future SST a reality.

## Other Major SST Reports

The Convair SST study reported here is one of four to come to light in recent months. Others are: United Research, Inc.'s report to FAA entitled "The Feasibility of a Commercial SST"; ICAO's "Technical, Economic and Social Consequences of the Introduction of a Commercial SST"; and, the Federal Aviation Agency's "The Commercial Supersonic Transport Aircraft Report," the latter an outgrowth of the United Research work. ■

# 32 Strikes Cost the Airlines \$150 Million

**A**S CONGRESS PONDERs the prospect of legislating an end to sudden strangulation of the U.S. air transportation system by strikes, an *AIRLIFT* survey reveals that work stoppages over the past five years have cost the airlines better than \$150 million in lost revenues.

During the same period, striking or furloughed employees have lost at least \$40 million in wages on 10 airlines. The figure more likely would approach \$50 million for all carriers.

The explosive potential of the airline labor situation was brought sharply into focus late in February when some 2500 flight engineers on six airlines walked off their jobs for six days (Feb. 17-23). Early estimates of losses came to \$27.7 million or more than \$4 million a day for the strike period. Between 500,000 and 600,000 passengers were affected by the short tie-up.

But the impact extended far beyond the air transport industry, hitting hard at resorts, such as Miami Beach and the Caribbean, to the tune of millions of dollars a day. For Eastern and National, the strike broke when both carriers were enjoying their best advance bookings to Florida in four years.

## \$8 million in six days

For U.S. international airlines (Pan Am and TWA) it meant about \$8 million in revenues and 70,000 passengers lost, but proved a bonanza to foreign flag airlines which had plenty of jet capacity to handle the business.

But more than anything else, the engineer walkout attracted new and more vigorous attention to the sensitivity of air transportation to paralyzing stoppages by relatively small groups.

The most striking example of recent vintage is the 137-day disruption of service at Northwest Airlines at an incalculable revenue loss. Spawned of a contract dispute with 28 IAM flight engineers, it resulted in the furlough of 6900

## AIRLINE LABOR DISRUPTIONS 1956-1961

Airline	Dates	Days	Union
American	12/ 9/58- 1/11/59	24	ALPA
	2/17/61- 2/23/61	6	FEIA
Capital	10/14/58-11/23/59	37	IAM
Central	4/ 7/58- 4/17/58	11	IAM
Continental	6/ 2/60-10/10/60	131	FEIA
Eastern	11/24/58-12/31/58	38	FEIA, IAM
	6/12/60- 6/23/60	11	ALPA
	2/17/61- 2/23/61	6	FEIA
Flying Tigers	1/20/60- 2/19/60	31	TWU (navigators)
	2/17/61- 2/23/61	6	FEIA
Lake Central	11/23/58-12/ 4/58	11	ALSSA
Mohawk	3/17/60- 4/ 3/60	18	ALEA
National	8/17/56- 8/20/56	4	ALPA
	9/23/57-10/24/57	32	ALAA (agents)
	2/17/61- 2/23/61	6	FEIA
Northeast	9/ 5/58- 9/ 6/58	1	IAM
Northwest	7/ 8/60- 7/23/60	16	ALPA*
	10/11/60- 2/24/61	137	IAM (flight engineers)
Ozark	9/59- 1/ 4/60	122	ALPA**
Pacific	6/ 6/59- 6/ 8/59	3	ALDA
Pan Am	7/15/58- 7/19/58	5	TWU
	2/17/61- 2/23/61	6	FEIA
Riddle	3/14/60- 3/15/60	1	ALEA
Southern	***8/ 3/59-10/ 6/59	65	ACMA (mechanics)
	****6/ 5/60-10/ 1/60	119	ALPA
TWA	11/21/58-12/ 8/58	19	IAM
	2/17/61- 2/24/61	8	FEIA
West Coast	11/21/58-11/24/58	4	IAM
Western	1/ 9/56- 3/22/56	26	BRC
	2/21/58- 6/10/58	108	ALPA
	*****2/18/61- 3/ 2/61	15	FEIA

\* Refusal to fly DC-8Cs. Operations continued.

\*\* Affected F-27 equipment introduction. DC-3 operation continued.

\*\*\* Airline resumed service. Strikers not returned.

\*\*\*\* Airline resumed full service. Strikers not returned.

\*\*\*\*\* Service resumption started.

*RECAP OF STRIKES* shows recent Northwest stoppage was one of the longest yet suffered by an airline.

NWA employees for the past three months. About 1000 have been idle since October.

With the significance of the FEIA walkout fresh in its mind, the yearling Kennedy Administration on February 24 named a three-man emergency board to study the dispute and Northwest immediately resumed partial operations.

The bulk of the airlines' exposure to labor shutdowns stems from the cockpit, the five year analysis shows. Of 32 individual stoppages, 17 have originated with flight personnel. With each walkout on each airline counted as one disruption, the FEIA has been the source of nine, ALPA seven and the NWA engineers (IAM) one. IAM mechanics account for five others, the TWU and ALEA (2) and the ALAA, ALDA, ALSSA, ACMA, BRC each were involved in one.

In all, the 32 tie-ups completely or partially affected 1027 airline/days of service, the equivalent of grounding one airline for more than 2¾ years.

Probably the industry's most bitter labor dispute involves a local airline, Southern Airways, and its pilots. The strike began last June 5 when 140 ALPA pilots refused to fly for Southern. It ended, according to the company, on Oct. 1 when full service was restored.

## Pilots lose \$952,000

During this period alone, the airline lost more than \$1 million in revenues and about 86,000 passengers. Non-striking Southern employees lost close to \$500,000 in wages, whereas the striking pilots lost \$952,000.

Southern's ALPA pilots, long since replaced by non-union flight crews, continue to press for a break in the

strike, even to the extent of setting up a competing airline, circulating smear literature attacking the safety of Southern's operation and filing some 98 lawsuits against the airline.

The five-year record presents a strong case for a single union in the cockpit. For example, 15 of the 17 strikes originating from cockpit unions occurred on seven of the eight airlines which have more than one bargaining group on the flight deck. Only United, in the two-union group, was not struck, its last cockpit walkout occurring in 1955.

Four airlines with a single cockpit union (Braniff, Capital, Delta and Northeast) had no pilot strike.

Another index of the mounting airline labor relations problem is the increasing number of contracts the carriers have on file with the National Mediation Board. In 1940 there were only 44 on record. By 1945 this had increased to 98. In 1950 the figure spiraled to 241 and during the last decade has slowly edged upward to an all-time high of 284 on June 30, 1960. ■

## To Pan Am—Panagra:

# After 32 Years, Court Says 'Split'

**Federal judge finds Pan Am violated antitrust statutes in blocking Panagra's entry into U.S., orders carrier to show cause why it should not drop all holdings in Panagra**

By ERIC BRAMLEY

**A** 70-PAGE OPINION by a federal judge may break up one of the longest and uneasiest partnerships in U.S. aviation history—the 32-year-old 50-50 partnership of Pan American-Grace Airways by Pan American World Airways and W. R. Grace & Co.

It may also reshape the U.S. airline setup in Latin America, but exactly how this will be accomplished remains to be seen.

After 19 months' deliberation, Judge Thomas F. Murphy has ruled that PAA violated antitrust laws by continually blocking efforts of Grace to get Panagra extended from the Canal Zone to the U.S. PAA must show cause why it should not be required to divest itself of its stock in Panagra. Grace and Panagra, on the other hand, are not guilty of antitrust violations.

### **OK on all other counts**

The ruling, in U.S. District Court for the Southern District of New York, did not uphold all of the government's antitrust charges. In addition to clearing Grace and Panagra, the judge found:

1 Original joining of PAA and Grace was not the result of a conspiracy, but was a lawful combination with legitimate ends.

2 The understanding on division of territories, under which operations of PAA and Panagra were conducted, was not unreasonable under the circumstances and not in itself a violation.

3 Grace's stock ownership in Panagra does not by itself violate the Sherman Act.

CAB has jurisdiction of the question of Grace's control in Panagra's management.

The decision is causing widespread speculation. If it becomes final, after possible appeals and other legal moves, will Grace offer to buy PAA's interest, and how would

CAB look upon such ownership of an airline? Will Braniff emerge with control of Panagra?

In 1954, CAB noted that the public interest would be "well served" by establishment of a single independent carrier, free from control of either PAA or Grace, operating from Houston and Miami to points on the combined routes of Panagra and Braniff.

### **A formal offer by Braniff**

However, neither PAA nor Grace was willing to let go of its 50% interest, and Braniff's efforts to take over were unsuccessful. Less than three years ago, Braniff told the Justice Department in a letter, text of which never has been released, that it was willing to negotiate to buy out both partners. Grace could continue to hold a minority interest if it wished, but Braniff must have effective control, the letter said. This offer still stands.

Panagra was formed in 1929 by PAA and Grace, initially for operations between the Canal Zone and Chile. Judge Murphy says that since 1941 there has been a "bitter family quarrel . . . arising out of the unhappy and quondam unholy union . . ."

Starting in 1947, Panagra was permitted to use PAA's route between the Canal Zone and Miami. Later, through interchange with National and PAA, it was able to serve New York. But Judge Murphy finds that all efforts of Grace to get Panagra to the U.S. on its own were blocked by PAA.

"Pan American has monopolized or attempted to monopolize the market in issue and in the process has seriously restrained competition from Panagra and caused the creation of a situation that cannot be righted so long as it retains the negative control . . . over Panagra," he says.

He also notes: "The ideal route pattern as envisaged by the CAB today is to have two carriers, Pan American and a merged 'Panagra-Braniff' . . ."



GORDON R. MCGREGOR, TCA's president since 1948.

## What TCA Wants In U.S. Bilateral

By ANTHONY VANDYK

**M**ONTREAL—Dissatisfaction with the present U.S.-Canadian bilateral agreement was voiced by G. R. McGregor, President of Trans-Canada Air Lines, in an exclusive interview with *AIRLIFT*.

The Canadian aviation spokesman said that his airline badly wishes to provide service to Miami from either Montreal or Toronto, preferably both, but cannot do so because the bilateral does not permit TCA to serve any city in the Southern U.S. other than Tampa. Although Eastern and Northeast operate from Montreal to Miami via New York and Boston respectively, TCA may not reciprocate.

Another route sought by McGregor is Montreal-Chicago. Oddly enough, this route is served by two European carriers—Air France and Lufthansa, which can carry passengers between these two cities non-stop. The bilateral does not permit either a U.S. or a Canadian carrier to do so.

Montreal-Chicago passengers seeking a North American carrier can travel by TCA but they must change flights at Toronto. McGregor is convinced that there is plenty of traffic to justify daily, non-stop, TCA service between the two cities.

Other routes not contained in the bilateral but sought by McGregor are Chicago-Winnipeg and Montreal/Toronto-Los Angeles. He is also interested in providing service from Vancouver to San Francisco and Los Angeles. Another concession he would like to win from the U.S. is the right to make a traffic stop at Boston on flights from Eastern Canada

to destinations in Bermuda and the West Indies.

McGregor realizes that, for the moment, the Canadian government has little chance of successfully persuading the U.S. to revise the present bilateral since there are few concessions that U.S. carriers currently want from Canada. "Our postwar experience in bilateral negotiation warns us against asking for the earth," he says. The imbalance of interest makes the U.S. reluctant to start formal negotiations to change the present bilateral, he admits.

While he will continue to press his government to try to win new concessions from the U.S., McGregor is busy planning ways to gain new U.S. business from routes permitted under the present bilateral. This spring TCA will start through DC-8 service from Cleveland to Europe via Montreal.

About the same time it will introduce the Vickers Vanguard on its routes to New York. By mid-summer TCA should have retired the last of its piston-engine fleet and be operating turbine-powered aircraft exclusively. TCA has in service or on order 11 DC-8s, 23 Vanguards and 49 Viscounts.

### New fares should help

To take full advantage of its turbine fleet TCA has adopted a completely new fare structure, (*AIRLIFT*, Dec.). The decision to introduce the new fares last January was based, in McGregor's words, "not on any startling or revolutionary theories, but on a simple and quite apparent fact of transportation life—the further a passenger travels, the less it costs the carrier per mile."

The TCA president points out that this is not peculiar to the airlines but applies equally to all forms of mass transportation. "Air fares based on rail and ship fares reflected this fact, but to a lesser degree than seems to be indicated by the comparative cost figures," according to McGregor.

TCA carried out studies in 1958 and 1959 that, in McGregor's words, "brought forcefully to our attention a fact which we had long suspected." The fact was that direct operating costs on each of TCA's North American route segments varied widely from more than 14 cents per seat-mile on extremely short routes to five cents on the longer domestic operations.

Long-distance passengers were subsidizing short-haul passengers to a substantial degree, while the short-haul passenger was receiving his transportation at less than cost. Using curves to reflect the operating cost figures of TCA's three turbine aircraft models, the airline established that existing passenger fares in the 400 to 600-mile range were properly related to costs while passengers traveling fewer than 400 miles were being financially favored and those traveling more than 600 miles were being penalized.

### Tailored to 2200 segments

A new set of fares was then plotted for TCA's 2200 individual North American route segments, based on the cost curve, for both first and economy class travel. Some deviations from the cost curve were made for very short routes where the fares would have been impossibly high.

TCA also has introduced weekend and midweek excursion fares priced some 25% below the normal economy fare. These fares are available on a 23-day and 24-day return basis and are valid from Oct. 1 through May 31.

McGregor is well aware that, in 1961, the new tariff will produce an overall reduction in yield per passenger-mile. However, he is confident that "the potential economies of the DC-8 and the Vanguard and the known economies of the proven Viscount, coupled with the increased traffic that will be generated by the new fares, will compensate for that reduced average return per passenger-mile." ■



Actual ATC radarscope photo showing transponder-equipped aircraft.



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## Convair Hustlers Smash Six World Speed Records



One of SAC's record-breaking B-58 flight crews checks final flight plan prior to takeoff. This J79-powered Hustler logged a top speed of 1430 mph during its run.

### Log Top Speed of 1430 mph

EDWARDS AFB, Cal.—Six world speed records, five of them Russian-held, were nearly doubled here recently by two Convair B-58 Hustlers from SAC's 43rd Bomb Wing.

The Hustlers were powered by General Electric J79 turbojet engines, which have now helped set 18 world speed, altitude and payload records in little more than a year.

A B-58 piloted by Maj. H. J. Deuschendorf averaged 1061.8 mph while carrying a 2000 kg (kilogram) payload over a 2000 kilometer closed course. The record claim, which is over 450 mph faster than that previously held by a Russian Tu-104, was also entered for the no-payload and 1000 kg payload categories.

Two days later another B-58 swept over a 1000 km course at an average speed of 1248.7 mph. Records were claimed for the same three payloads. The Hustler, piloted by Maj. H. E. Confer, logged a top speed of 1430 mph during the run.

The previous 1000 km record was held by an Air Force F-101 Voodoo in the no-payload class, with 700.5 mph, and by Russia, (639 mph), in the 1000 and 2000 kg categories.

### B-58 AWARDED THOMPSON TROPHY...

WASHINGTON, D.C.—The Convair B-58 piloted by Maj. H. E. Confer was awarded the coveted Thompson Trophy in late February for its record-breaking closed course speed of 1430 mph.

It is the first time in aviation history that the trophy has been won by a heavy bomber. The award is presented annually by the Air Foundation of Cleveland.

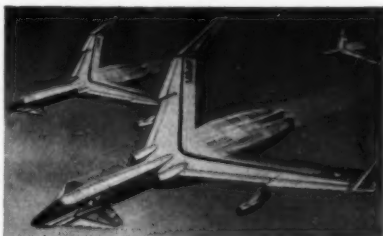
## Nuclear Flight by '65 Is G-E Program Goal

CINCINNATI, Ohio—Nuclear-powered flight by 1965—or even sooner—is both possible and practical, according to David F. Shaw, general manager of General Electric's Aircraft Nuclear Propulsion Department.

"Since January, 1956, we have successfully operated modified J47 turbojets for hundreds of hours on nuclear power," Mr. Shaw said. "We have also successfully completed experimental tests on advanced reactors, and are now designing a high-performance nuclear-powered turbojet for flight testing in the mid-1960's.

"Full-scale turbojets specifically designed for nuclear power have also been operated hundreds of hours in test cells on chemical fuels. They have met or exceeded all performance estimates.

"It is no longer a question of can we build a nuclear-powered aircraft engine, but when we can place such an



Proposed Convair Nuclear Airplane

engine in an aircraft," Mr. Shaw said. "We have reached the point of saying that when an airframe is ready, we can have the direct-air-cycle nuclear turbojet ready for installation.

Use the coupon (check GEA-7105) if you would like further information on G.E.'s aircraft nuclear engine program.

## The CJ-805 Aloft: 880 Nears First Anniversary; 990 and

CONVAIR 880—Fastest jetliner now in commercial service, the Convair 880 will enter its second year of operation on May 15. The CJ-805-3 powered transport is now flying with Delta, Northeast, and Trans World Airlines, and will "go international" in mid-year when Japan Air Lines inaugurates 880 jet service linking Tokyo with other major Far East cities.



CONVAIR 990—The 640-mph jet flew for the first time on January 24 and is being flight tested prior to scheduled service with AAL, REAL, Swissair, and SAS later this year. Four G-E CJ-805-23 aft-fan engines power the 990, whose maiden voyage was described by Convair Chief Test Pilot Don Germeraad as, "The cleanest I've had in six first flights."





## SAC Hustlers Complete Six Months of Operation

CARSWELL AFB, Tex.—SAC's 43rd Bomb Wing—the Air Force's first operational group of Convair B-58 Hustlers—has completed its first six months of operational duty here.

During more than 4000 hours of engine flight time, reliability of the Hustlers' J79-5B turbojets was evidenced by a rate of approximately 400 hours between unscheduled engine removals for all causes.

Engine flight time for all phases of the Air Force's and Convair's B-58 program is currently over 25,000 hours. Four General Electric J79's power the Mach 2 bomber with a combined thrust of over 62,000 pounds.

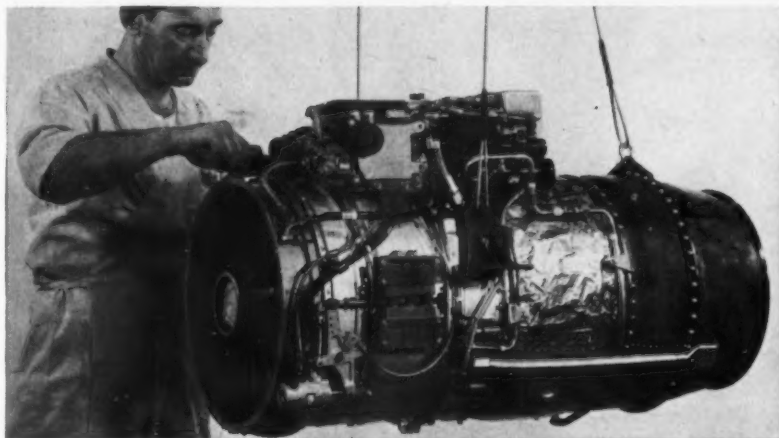
## First Year of Flight Testing Confirms Aft-fan Principle

CINCINNATI, Ohio—"General Electric's first year of turbo-fan flight testing has proven beyond a doubt the soundness and practicability of the aft-fan principle," according to G-E Commercial Engine Operation Manager Neil Burgess.

His comment was occasioned on the first anniversary of American turbo-fan flight last February 19. On that day a year ago a G-E-leased RB-66 flew aloft powered by two CJ-805-23s.

"The engines," reported Mr. Burgess, "have been operated over a complete range of altitudes and air speeds, under severe distorted inlet conditions, and with two entirely new nacelle designs. The fan has in no way compromised the good throttle response characteristics of the engine."

"In all cases," he said, "we have been completely satisfied with the engine



G.E.'s modified 10-to-1-ratio J85 will be ideal for VTOL, STOL, and copter boost power.

## J85 Modified to Produce 10 to 1 Power Ratio

LYNN, Mass.—General Electric's J85 turbojet engine can now be modified to produce a thrust-to-weight ratio of more than 10 to 1.

Production J85 engines currently entering service with the Air Force deliver a specified 7.6 to 1 ratio, the highest of any military production jet powerplant.

The 10 to 1 power ratio makes the modified J85 an ideal engine to provide auxiliary power for VTOL and STOL aircraft. Here its primary use would be to provide boost power for takeoff and landing operations.

Adaptation of the modified engine to helicopters, where it could substantially augment cruise power and lift power, is also a possibility.

operating characteristics. In particular, the low noise levels of the engine are outstanding."

During this period, two other aircraft—the Convair 990 and G.E.'s Caravelle VII—also initiated flight test programs using G-E aft-fan engines.

A growth version of the commercial aft-fan engine, the MF239C-3, is being offered for the MATS SS467 cargo transport. It will develop up to 23,800 pounds of takeoff thrust, as compared with 16,100 for the CJ-805-23.

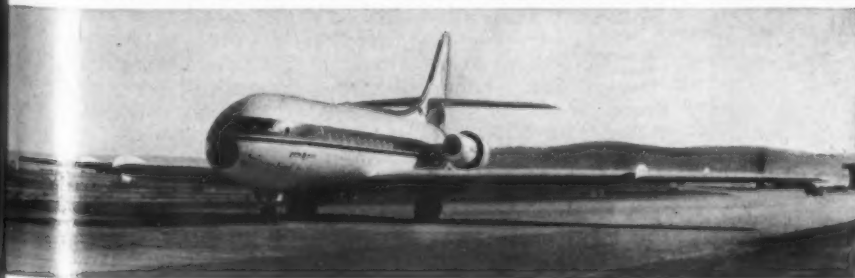
Boosting the J85's power ratio to 10 to 1 was accomplished by removing accessories—reducing engine weight from 325 pounds to less than 300—and by increasing engine speed and temperature. Over-all dimensions are similar to those of the J85-7.

A dry commercial version of the J85—the CJ610—develops 2850 pounds of thrust, weighs only 355 pounds.

Use the coupon (check GED-4095) if you would like further information on the G-E J85 turbojet engine.

## Caravelle Flight Tests Progress Well

SUD/DOUGLAS CARAVELLE VII—Now entering its fourth month of intensive flight testing after conversion to General Electric CJ-805-23 aft-fan turbojet engines, G.E.'s Caravelle VII is currently in the midst of a heavily instrumented flight program marked for completion this spring. Tests have included in-flight noise measurements, duct inlet design confirmations, and thrust reverser trials. Performance to date, including noise level and short-runway prowess, has been highly favorable.



### FOR MORE INFORMATION

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Heading up the operation at Four Corners—  
(left) Jack Roberts, President, and (right)  
Tom Buess, Sec.-Treasurer.

# Rocky Mountain Haven at Four Corners



Four Corners Aviation, Inc., at Municipal Airport, Farmington, New Mexico. Flight office and lounge are on the right.



The pilot's lounge at Four Corners . . . free coffee; friendly people, and lots of "hangar talk".



Mobile refueling is prompt and efficient. Clean windshields and an alert "walk-around" are S.O.P.

Located near the junction of Utah, Colorado, New Mexico, and Arizona, Four Corners Aviation is home base for some 88 fliers from four states. The transient business is brisk also, lured by almost continuous CAVU weather, winter and summer vacation facilities, and a booming economy . . . oil, gas, uranium, sheep, cattle, and truck farming.

At an elevation of 5500 feet, Farmington's Municipal Airport boasts three first-class runways (longest is 6800 feet), border lights, FAA Radio and Weather, and an Omni station. The service at Four Corners is first-class, too—24-hour mobile refueling with high performance Phillips 66 Aviation Gasoline (80 and 100 octane), tie-downs, hangars, certified A&E maintenance and overhaul, and a pleasant lounge where the coffee is always on. Four Corners, a Cessna Dealer, also offers flight and ground instruction . . . as well as single- and multi-engine charter.

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# Rome's New Airport

## A Pilot's Dream, But . . .

**Military dominance in planning  
results in some major miscues**

By WAYNE W. PARRISH

**R**OME'S NEW \$50 MILLION AIRPORT is a vast improvement over the cramped and restricted Ciampino field that has served the Italian capital for so long.

Appropriately named Leonardo da Vinci Airport after the famed sculptor, artist and inventor who visualized airplanes some centuries ago, the new facility is on the seacoast at Fiumicino about 18 miles west of Rome near the resort town of Ostia. Nearby is the mouth of the famed Tiber River, the archeological areas of the Gates of Claudius and Trajan, and the partially uncovered ruins of Ostia Antica, the ancient port of Rome built some 1800 years ago.

In many ways the airport is a pilot's dream. The approaches are excellent and ideally free of obstacles for flight operations. Six square miles comprise the airport area.

The two main runways, costing \$7 million, are 200 feet wide and 13,000 and 8860 feet long, respectively.

Although there have been plans for building an extension of the nearby electric rail line into the airport to provide 20-minute service to the heart of Rome, this project is on the doubtful list. A three-lane highway, dangerous because of the heavy traffic, provides a 45-minute average service. A four-lane expressway, badly needed in any case, would be of more use than the railroad for most purposes.

*AIR VIEW of Rome's new airport built on the swamps of Fiumicino 18 miles west of the Italian capital. WWP reports on its pros and cons.*



The Italian press has been severely critical of the airport. Much has been written about scandals in cost, in delays, and in design. Some of the criticism is true and justified, some of it unfair. Whatever its defects (and there are many), the new facility is a great advance over what Rome has had.

The terminal itself, a grandiose structure a half-mile from extreme gates, is not as good in design and execution as it could have been, primarily because people inexperienced in airline operations were responsible. By and large, the airlines were not consulted. Civil aviation in Italy is under the direct thumb of the Italian Air Force. The Air Force did a good job of designing the airport itself, but fell down miserably in the civil area.

The terminal is quite attractive, although a pale shade of Paris' new Orly structure. It has spaciousness and fine use of glass and architectural detail. But no provisioning was made for air conditioning or for cross-ventilation. The big concern is what the terminal will be like when Rome's summer temperature approaches the 100-degree mark. It will be a hot-house of gigantic proportions.

### Costly to cool

To air condition the building now not only will be extremely costly, but will upset the architectural features which are not bad at all. (It is said that the restaurants are air conditioned, and maybe a few other areas, but these are but a fraction of the overall building.)

Paris has a national showcase for airline passengers. Rome has an abortion performed by military people who had neither the understanding nor the sense of national pride found in France. It's too bad. Even so, the facility should not be completely damned.

Another boner is baggage handling. Somebody had an



TWA Photos

**ROME TERMINAL.** Floor to ceiling windows give broad view of ramp area from restaurant.



TWA Photo

**ROME'S NEW TERMINAL** is vast improvement over crowded Ciampino. Note lobby spaciousness.

idea, that possibly looked good on paper, that arriving passengers and baggage would go to the main floor, one level up from the ground. They would go through customs and immigration, then the passengers would walk straight ahead to get in buses and cars, while the baggage went back to the ground level. Then cars and buses would move out, swing around underneath the terminal and pick up the baggage.

The idea is ridiculous in concept and practice. A costly installation of moving belts will have to be junked and some other system installed. It's too bad.

Moving from Ciampino to Fiumicino was somewhat painful since the building was not really ready. For example, a month after opening there wasn't a single cigarette or trash receptacle in the terminal—the 400 on order hadn't arrived. Toilet facilities were incomplete, the entrances were unmarked, and they resembled the cheapest kind of old railroad facility. (Obviously the Rome planners had not visited Paris to see the Orly plans.)

Rome's main asset is space, lots of it. The restaurant and lounge facilities for transit passengers are ample, although lacking decorative touches. There is a sizeable restaurant, operated by Wagon-Lits, but it also lacks the kind of spit and polish which makes Orly outstanding.

There apparently is no bar lounge, but you can get a drink standing up at a series of snack bars.

There is plenty of walking to do, and for long distances. But the two fingers are laid with a serrated rubber that is excellent to walk on.

Obviously a lot of money was spent on lighting. But it doesn't come off, somehow. There are good features, such as many clocks, an electronically-controlled board showing arrivals and departures and gate numbers, and ample information at the gates.

For the time being, passengers on domestic Italian services will use a temporary building adjacent to the main terminal. About 6000 passengers a day can be accommodated in the total facility.

One feature of Rome which may or may not be well planned—only time will tell—is the separate building for meteorology and dispatching. The weather office is spacious and has a closed-circuit TV setup connected to either end of the main terminal. But most crews will have to go to the separate building. While it is some distance by foot, it may be a good idea in the long run to keep this feature away from the passenger terminal. ■

## Orly; A Showcase

By PHIL GERACI

**W**ITH A FLOURISH of national pride the French lifted the curtain on a new international airport terminal at Orly on Feb. 24 in a show unrivalled for pomp and splendor. In a spectacular \$24 million edifice of steel and glass the French have a showcase worthy of world attention.

The lavish terminal is likely to become one of France's major sights. It is unique in many respects. It is the largest French construction project since Louis XIV built the Invalides 300 years ago.

Erected astride a super highway (National Highway # 7) over which traffic speeds to downtown Paris, 25 minutes away, the terminal houses a complete shopping



**HOST AT ROME** during WWP's tour of the new airport was TWA's manager at Rome S. W. Chambers (left).



M. PIERRE COT



M. LOUIS COUHE



M. PIERRE BOURSICOT

**THREE KEY MEN** in Paris airport development (above, L to R) M. Pierre Cot, director general of airports; M. Louis Couhe, the man who shaped the Orly program, and M. Pierre Boursicot, head of the airport administration.

center. It has 1,300,000 sq. ft. of floor space. Its construction consumed more than 7000 tons of steel, an amount almost equaling the Eiffel Tower.

More than 2000 people work in the new terminal building. An additional 10,000 work elsewhere at Orly. In front of the terminal is a parking area sufficient for 5000 autos. On the runway side, bays will park 45 jet aircraft.

Fuel arrives via a three-mile-long underground pipeline from the Athis-Mons fuel depot on the Seine river. A hydrant refuelling system can satisfy a 707's 20,000-gallon appetite every 20 minutes.

The central terminal structure measures 650 ft. long by 915 ft. wide. It rises six stories. Below ground is a basement and a sub-basement.

Transit passengers have virtually the entire second floor to themselves. Located on this floor are a lounge and numerous shops (one, for example, sells antiques) in an atmosphere of unparalleled elegance. The lack of customs duty keeps prices within reason.

The transit floor has its own hotel and restaurant. Outside the customs area are other restaurants and another hotel. A chapel is divided by a glass wall, for passengers

who have cleared customs and those who have not. Elsewhere in the terminal is a 300-seat movie house.

Considerable planning has been done to expedite passenger handling. The "Orly system" calls for outgoing baggage inspection during checking, a scheme already in use at the old Orly terminals.

Arriving passengers clear immigration and health through a series of channels. Hand baggage is cleared at the same time. Passengers with no checked baggage can be cleared in one stage.

Scores of multi-lingual passenger service girls, dressed in the latest Paris fashions, assist baffled travelers. Check-ins are performed on the ground floor. Passengers then move by escalator to the main floor to await departure. A large electronic board lists flights by number, airline, time and gate number, and indicates delays. A system of miniature lights disseminates the information throughout the terminal.

The Orly terminal is insulated against aircraft noise by free-floating  $\frac{3}{4}$  in. glass panes and flexible wall panels. The building is slightly "pressurized" to dispel jet exhaust fumes.

The terminal building contains 20 escalators, 11 high-speed passenger elevators, six luggage elevators, five restaurants and bars and two terraces. Access is by 60 automatically-operated doors.

Baggage is handled on the ground level. Passenger access to aircraft is on the floor above. The third floor houses the bars and restaurants. The fourth floor has an observation terrace, the theater and a 40-room, air-conditioned hotel.

On the fifth floor are offices of 27 airline companies and some of the airport's technical staff. Terraces overlooking the airport and the Fontainebleau forest are on the sixth floor.

Separate communications facilities are provided for airport and airline personnel. Airport staff members carry transistor receivers with which they receive messages. Thus they never need to be paged over the public address system.

Announcements are kept to a minimum. Careful design minimizes distortion in the loudspeaker system so that it appears to "whisper."

The terminal building can be expanded to meet anticipated traffic growth. Presently able to accommodate five million passengers (three million are expected to use the facilities in 1961) the terminal can be made to handle up to eight million.

Orly airport has two north-south runways, one 6244 ft. and the other 8100 ft. An east-west runway is 11,205 ft. long. All runways are 200 ft. wide.

Most revenue comes from rentals, landing fees (reasonable by European standards), passenger service charges and concessions. The agency is virtually self-supporting. Last year only \$1,320,000 had to be supplied to meet its deficit (about 30 cents for each passenger handled.)



PARIS terminal exterior gives little clue to the showcase of splendor that lies within.



## THE NEW 707 ASTROJET<sup>\*</sup> JET AGE: STAGE II

Now offered in regular transcontinental passenger service, American Airlines' new 707 Astrojet brings you a new standard of jet performance by the airline that's *first choice of experienced travelers*.

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*AIRLINE PARTICIPANTS in earlier Northwestern panel (L to R) are: H. D. Fellows, TWA; P. T. Albert, Flying Tigers; Hal E. Nourse, United; A. J. Gellman, non-airline moderator; A. H. Norling, then of Capital; and W. Stewart, American.*

## Train Your Own Airline Execs

By ELIEZER KRUMBEIN\*

**Airlines must  
promote from within,  
but management  
training is a vital  
necessity, both  
internal and external**

**A**FTER YEARS of executive training in transportation, Northwestern University's Transportation Center has had a generous exposure to the problems of executives in airlines, trucking firms, railroads, barge lines, pipelines and the traffic departments of manufacturers.

All have executive personnel problems. Each one has a special interest in executive development. Where do the airlines stand? Two cases might set the stage:

**Case 1**—An airline, expanding so quickly in personnel, promoted a top-flight salesman to asst. sales manager. He had done an outstanding job selling airfreight. Among his new duties was training a rapidly growing sales force to use the "total distribution" concept of selling airfreight—the concept that basic transportation costs are not always the out-of-pocket costs and that faster delivery cuts inventory costs, interest on investment, warehousing and packaging.

After 18 months, the airline was forced to let the asst. sales manager go. As a salesman he was excellent, mainly because he had an extraordinary gift of gab, a fine outgoing personality and was a free-wheeler in overcoming sales resistance.

### **A good salesman, but . . .**

But in directing a sales staff he was lost. He was accustomed to being a lone operator and had never learned to make policy decisions. He had not been trained in personnel problems. He had never had an opportunity to learn basic economic facts about transportation.

**Case 2**—A 45-year-old executive was promoted to a major airline finance post. His detail-mindedness and stubborn insistence on facts had endeared him to the president.

The airline had just elevated cargo to equal stature with passengers, placing a vice president at the helm. Then it

\* Asst. Director, Northwestern Univ. Transportation Center

moved in on confirmed surface shippers with a "consulting service." Armed with case histories prepared from market analysis, salesmen showed industrialists how profits could be increased by eliminating branch warehouses. The airline would handle distribution from a central warehouse or, perhaps, the manufacturer's plant.

But the newly-promoted finance man proved a stumbling block to the cargo group in its bid for more elaborate and better-planned sales literature and for hard-hitting mail promotion campaigns.

Their efforts met with stubborn resistance. He insisted on almost fanatical devotion to procedures already established. He expressed repeated preference for playing it safe, avoiding new expenses and going along with traditional sales approaches. He blocked every move to increase the effectiveness of the cargo sales force.

Called to explain at a policy meeting, the finance man expressed his entrenched opposition to any changing materials. Faced with intangible and elusive issues, he insisted on tangible facts which never could exist in the nature of the case.

And when it came to deciding what sales literature and methods to use in selling expanded cargo operations, he was all for whatever worked well in the past—when cargo was only incidental to the airline's activity. As the protégé of the president, he was the immovable object. And needless to say, the cargo department of his airline is making no headway.

What can be done to upgrade the quality of executives, particularly in the middle-management levels of airlines? This cannot wait for a lull in the business when key personnel can be spared from their immediate tasks. An able management must develop as the airline develops. Personnel with managerial talent and leadership must be uncovered and opportunity given them for executive training.

Several things have sparked a growing airline interest in developing executives. For one, managing an airline has become more involved. Labor problems, federal regulation and the increasing scale of operations have created headaches unknown to the grandfathers of today's businessmen.

#### **Executives become specialists**

With the increasing complexity of competition, job specialization has grown. Airline executives are specialists in operations, in maintenance, in customer services, some in business development, finance and the like. Top management must direct and coordinate these specialists who know more and more of their specialty, but less and less of the overall aspects of the business.

Some major airlines have drifted into the situation where all decisions are made at the top and no one does anything but gather facts and carry out orders. Others are building elaborate systems complete with standard procedures and rule books to cover every contingency. Here the junior executives and middle management are not permitted to make any significant decision without clearing it with the boss or the rule book.

Such organizations sacrifice initiative. No one makes mistakes or does anything new or differently. No one learns to exercise his judgment. Where managers are not forced to try their judgment and live with their mistakes, they never learn to do anything but play it safe.

It's true, airlines must promote from within their organization. They have special problems and special technology with which their executives must be familiar. This almost forces a policy of promotion from within.

But it's equally true that this policy, if not coupled with outside training, can lead to the type of disasters we have described. It can only work successfully if it goes hand

in hand with consistent, repeated and thorough training inside and outside the organization.

Some airlines are seeking to improve their executive group by bringing in alert youngsters, usually college graduates, and rotating them through various departments with the hope that over the years they will develop into executives of the future.

Two things might be said about this. First, an executive need not be a college graduate to succeed. Of Sears Roebuck's successful store executives, only 20% are college graduates, 32% had some college and 48% had none at all.

Second, proper training is essential. If the training is all internal, if no outside ideas are brought in to stimulate the young executives, the company oftens winds up with mediocre officers whose only solution to new problems is an old answer. There is no growing leadership. Nobody is willing to chance a suggestion on new procedure or policy. As executives are promoted, they may be looking at the future through a rear-view mirror.

#### **Confined training can't help**

What is required in executives is the ability to grasp broad problems even if new, to weigh alternate courses of action and then wisely to choose one course to act upon. Those whose training is confined to internal procedure do not, as a rule, have enough breadth of knowledge to see the overall problem, to say nothing of dealing with it.

From the standpoint of an individual airline, executive development is literally in the nature of a capital investment. Adequate provision must be made for building tomorrow's executive team just as it is for new equipment, new financing and even new mergers. Sears Roebuck, for example, when nearly one-fourth of its store managers were entering military service, was able to fill all these executive spots with Sears-trained men.

Obviously, few airlines duplicate the executive development programs of such firms as Sears, General Electric, DuPont and Inland Steel. But many airlines have taken to sending one or two executives at a time to such courses as the Northwestern Transportation Center's five-week executive development program. The approach used here is to have executives wrestle with a current major problem in transportation.

As a good example, the problem for next Northwestern session (see box) is a big one to the air cargo industry: "The Problems of Rising Distribution Costs—Their Impact on Shippers and Carriers."

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#### **Cargo Course Coming Up**

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Next on the agenda of Northwestern's executive training course is the theme "The Problems of Rising Distribution Costs—Their Impact on Shippers and Carriers." The dates: June 19 to July 21. There is no problem more important today to airline executives eyeing a future in air cargo.

Topics to be covered include: current cost problems; regional patterns of transportation demand; the relation of technological change to improved service and cost reduction; the legal framework of transportation regulation; the labor element in costs; how to use statistics in management analysis; and, how to use operations research in management decisions.

For additional details, write Dr. E. Krumbein, asst. director of education, Transportation Center, Northwestern University, Evanston, Ill.

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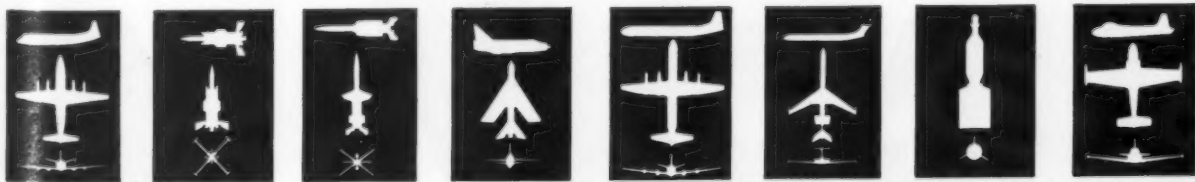
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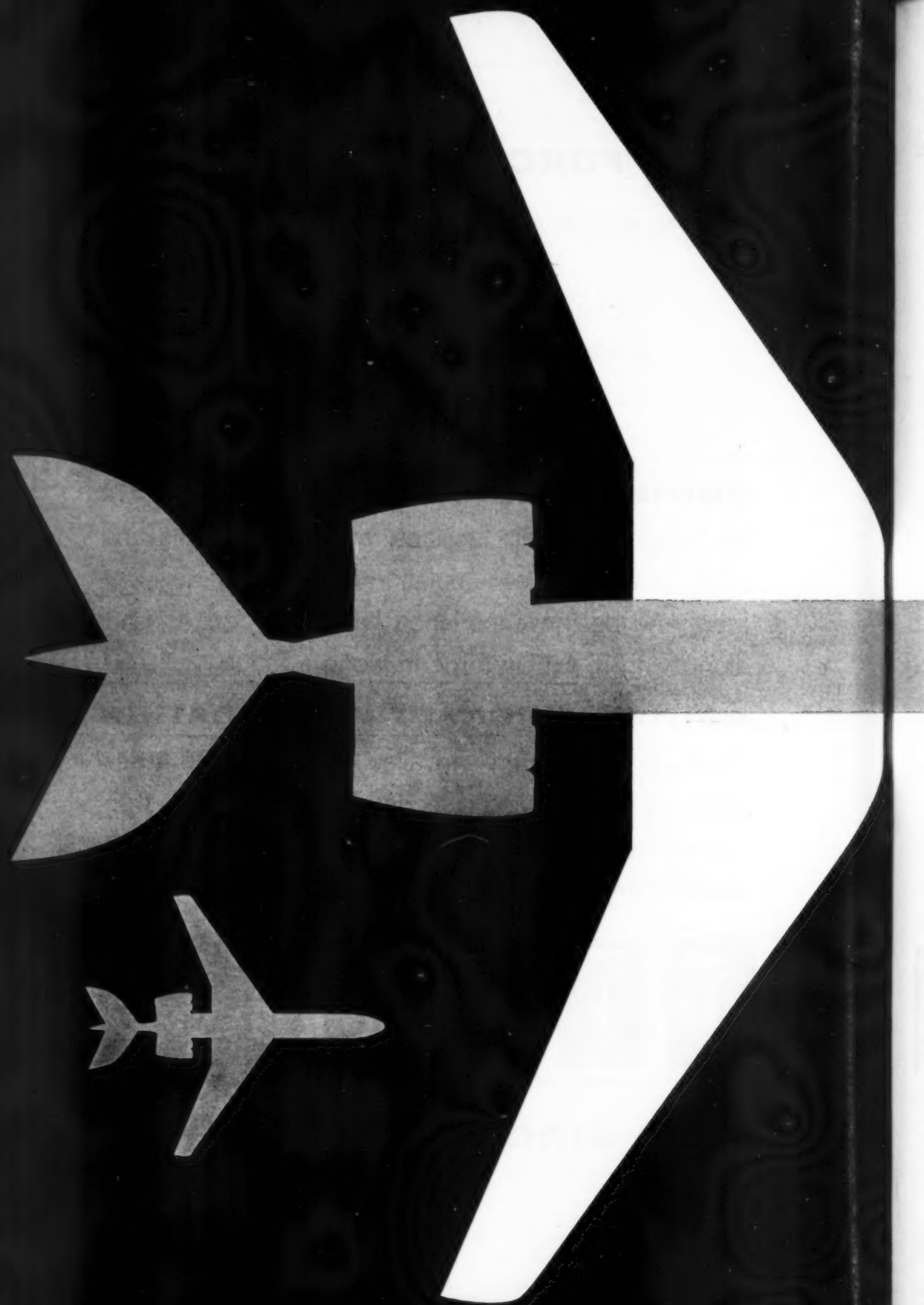
Products range from unrivalled turbo-props to a new family of "Clean-wing", second-generation jets—from supersonic military planes to active-service guided missiles and complete sophisticated weapon systems.

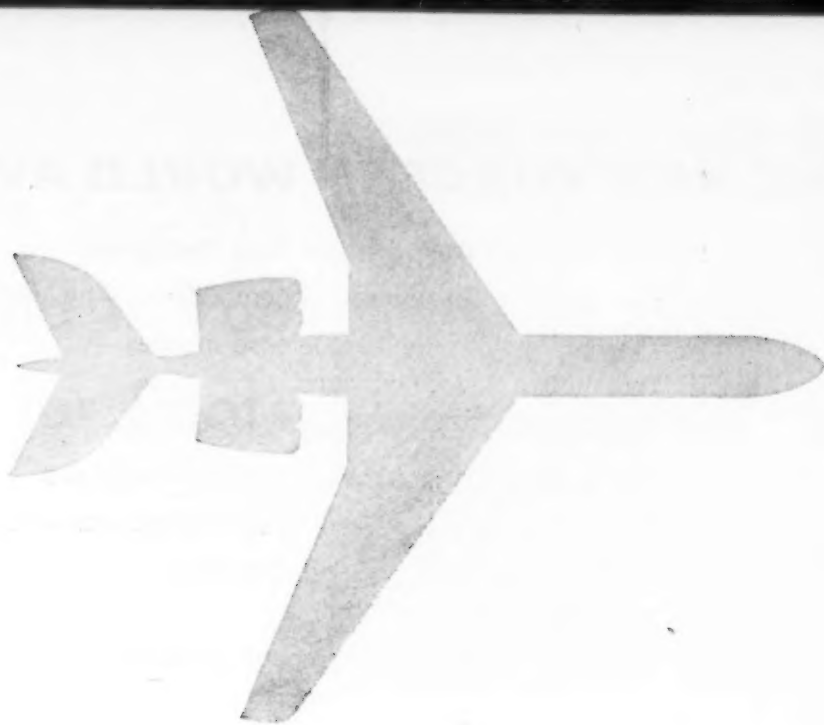


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# THE NEW FORCE IN WORLD AVIATION

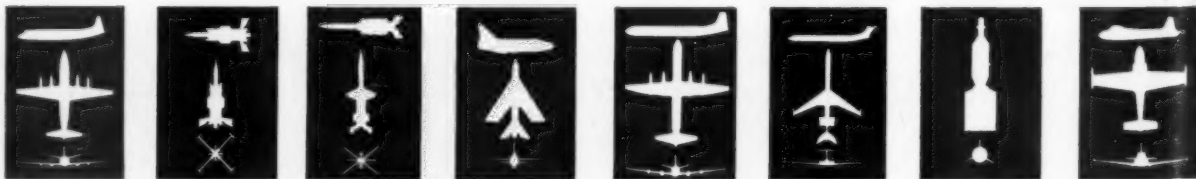
## British Aircraft Corporation Has Designed:

- The world's most popular modern airliner—The Viscount.
- The only major European defense missiles—Thunderbird and Bloodhound.
- The Royal Air Force's fastest fighter—Lightning.
- The world's most economic transport—Vanguard.
- The first "second generation" rear-engined jets—VC-10—BAC-107.
- The Allied Nations' most lethal portable anti-tank weapon—Vigilant.
- The Royal Air Force's all-through jet trainer—Provost.

## It has been entrusted by the British Government with:

- The project study for a Supersonic Airliner.
- The most advanced Tactical Strike Reconnaissance aircraft ever designed (TSR-2).
- The first all-steel research plane to pioneer the frontiers of supersonic knowledge (T-188).
- Many new weapon concepts which are still highly classified, including Blue Water, the support tactical surface-to-surface weapon for the British Army.

The four member companies of British Aircraft Corporation have, since World War II, built over 5,000 aircraft of all types. This number includes: 500 four-engined Turbine Airliners, 900 Twin- and Four-engined Jet Bombers, 1,700 Jet Fighters, and 1,100 Trainers.



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# FAA Tests Explore How Old Is Too Old for Pilots

Results could disprove  
agency's own age-60 rule

By BRAD DUNBAR

**F**AA HAS A SMALL but expert medical research unit that is openly dedicated to shooting down FAA's own most celebrated air safety rulemaking.

Airline pilots at this writing had not yet completed their promised finish fight against FAA's retirement-at-60 rule. But eight FAA specialists in a small basement clinic at Georgetown University Hospital had already begun a long-range research project aimed at replacing it with an accurate physical age rating that can be applied to the individual pilot.

It can be something less than illuminating for the layman to investigate such work only through descriptions by learned medical specialists: "... the development of instrumentation techniques and criteria for more precise diagnosis and prognosis of diseased states and of altered physiological conditions . . . for more accurate physiological aging rating." A close look at the test equipment is helpful; better yet, we seized the opportunity to take the Clinical Research Branch's one-day battery of aging tests, and to update an ancient private pilot's medical certificate in the process.

In the first week of a test program planned for some 50 subjects a month, some of the clinic's equipment was the newest and most advanced. Some was borrowed and makeshift. Almost all of it was impressive.

## A measure for reaction

A complex electronic "Psychomet" tests manual reactions to visual signals. On a Monday morning, it proved to us to be a most efficient ego-deflator. A row of buttons had to be pushed to duplicate lighted numbers, letters, colors and combinations of these "visual stimuli." With an almost human malevolence, the Psychomet managed to trip a circuit-breaker and abort a test run each time we managed two or three successive quick reactions.

In a crowded but clearly advanced optics lab, the usual eye tests were supplemented by a process which photographs the back of the eyeball, with its vital optic nerve, for the most detailed future comparisons. Another extremely sensitive device observes responses of the nervous



*PSYCHOMET tests manual reaction to visual signals.*

system by measuring dilation of the pupil of the eye.

There was the old grade-school hearing test with a jet-age touch: We listened through an earphone to the familiar droning voice reciting four-digit numbers. But instead of the simple fading voice, the numbers receded into a background of noise sounding for all the world like a low-frequency range near a thunderstorm.

There were the triangular-block-in-triangular-hole tests, the perception tests which flashed numbers instead of Jap Bettys on the wall and a remarkable lash-up called an Ergostat—a means for measuring and recording a subject's lung "flow" and CO<sub>2</sub> content after a given amount of work pumping bicycle-like pedals.

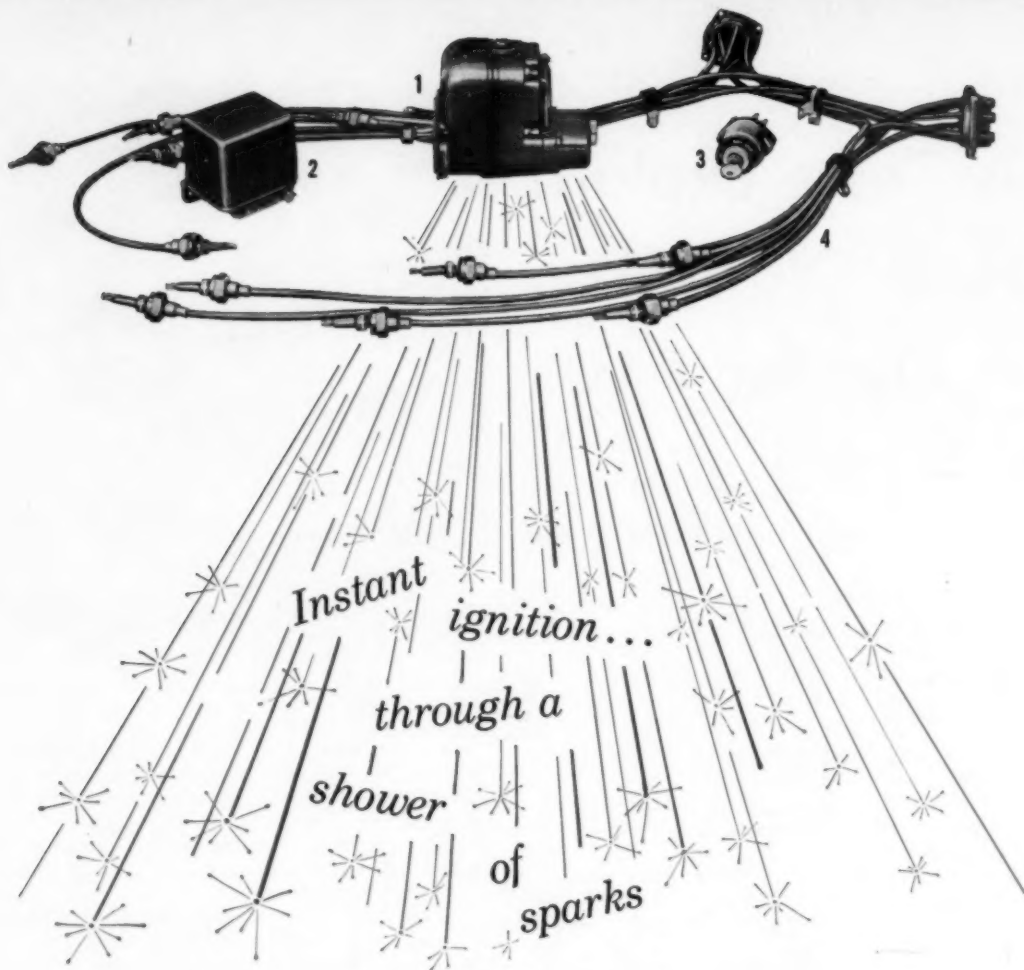
## Then the ballistocardiograph

Most startling of all, however, was the "ballistocardiograph." This, in effect, is a horizontal body support so delicately suspended that the movement caused by the heart's pumping of blood through the circulatory system is detected and recorded in an unbelievably detailed tracing.

Like physicians everywhere, FAA's researchers record their findings with an unintelligible mumble or a non-committal, "Fine, just fine." But "pertinent" information goes on request to the subject's family doctor, and the whole examination process would run up a fancy bill with private specialists.

Here, probably, is the clinic's success formula in its quest for a steady flow of suitable subjects: Do the medical certification work for airmen and traffic controllers in the Washington area and take volunteers from within FAA's big Washington headquarters, putting them through recurrent tests, year after year, all at no charge.

How long is "long-range," three . . . five . . . 10 years? Few will say. "Four to five years" is most often heard, but researchers seldom reach the end of their work. We were told by one intense young specialist that however valid it believes the age-60 limit to be, the Clinical Research Branch won't be really satisfied with its aging study "until we can identify not only the pilots who are functionally age 60 at 45, but also the rare and very valuable individual who at 60 has the functional ability of a man 45." ■



## BENDIX S-200 IGNITION EQUIPS 80% OF NEW U. S.-BUILT BUSINESS AND PRIVATE AIRCRAFT



**BENDIX S-600 LOW TENSION IGNITION HELPS SET NEW ALTITUDE RECORD.** Jerrie Cobb, first woman candidate for space flight, flew an Aero Commander to a world altitude record of 37,010 feet last September 20. In her record-smashing flight, officially sanctioned by national and world aeronautic authorities, her aircraft was equipped with a dependable Bendix S-600 low tension ignition system.

Builders of fixed wing aircraft and helicopters, using four and six cylinder engines, have been quick to specify the Bendix® S-200 ignition system because of its easier starting, smoother running, and greater durability. It is now used on four out of five new business and private aircraft.

Quicker, surer starting is accomplished through a new concept in high tension ignition for aircraft. The ignition-starting energy formerly supplied by release of a mechanical impulse coupling is replaced in the S-200 system by a retard breaker and battery-operated starting vibrator which produce a "shower of sparks" at the spark plug. A completely new type of ignition switch automatically controls starting and operation of the ignition system. Radio shielding is improved on the S-200 system through use of the Bendix "feed-thru" capacitor feature.

Aircraft operators wanting the advantages of the S-200 system may obtain it to replace present ignition and are invited to contact Scintilla Division distributors regarding installation, price, and delivery.

1. Retard breaker magneto 2. Starting vibrator 3. Ignition and starter switch 4. Harness assembly

**Scintilla Division**  
SIDNEY, NEW YORK



# TECHNICALLY SPEAKING

By Joe Murphy



**First flight with turbofans . . . Air cargo indecision . . . Fast repair for a big jet**

**Fan for fans**—March 12 was a big day for American Airlines' Frank Kolk, who, more than any other individual in the U.S., should get credit for spurring the evolution of the Pratt & Whitney and General Electric fan engines. Sir Frank Whittle and Rolls-Royce both helped, indirectly, but Kolk fought for the idea for years and on March 12 had the satisfaction of having his own airline launch fan-powered 707 service.

By the end of 1962, there won't be a "straight" jet in AA's fleet. All 75 will be fans, 50 Boeings and 25 Con-vair 990s.

Everything about the fan-powered 707 is a plus both for safety and economics. Takeoff in 17 to 20 seconds; better low-speed performance which virtually eliminates the takeoff decision problem; and a 15-mph slower approach speed, all impressed us on a recent demonstration flight out of Baltimore.

If it weren't for the high costs of engine conversion kits, airline engineers tell us there'd be lots of others making the change, too.

**Rooftop heliport?**—Nothing firm yet, but Pan Am's Juan Trippe and New York Airways' Bob Cummings haven't ruled out the possibility of a roof heliport atop the new Pan American building. It would be a choice spot, situated as it is over Grand Central station.

**Narrow gauge planning**—It's about time the airlines sit down and agree on some basic standards for at least the airplane provisions for mechanized cargo loading.

It's a good bet the "stevedore" approach to loading cargoplanes isn't going to last forever. And, with the trucking and rail industries getting increasingly active in such areas as tracks for loading, pallets and unitization of loads, an undecided airline industry could find itself faced with systems which are inefficient or incompatible with air operations. For example, airlines have no standard today for the track gauge for fuselage installations and no agreement on pallet sizes.

In short, they are in the same fix the railroads faced years ago with a dozen different track gauges. If they don't wake up, they might find themselves bound by standards to that 1/10th of one percent of the freight business for a long time to come.

**IAS changes**—We are most encouraged by the words of H. Guyford Stever, new president of the Institute of the Aerospace Sciences, at the recent Honors Night dinner promising some significant changes in the way IAS serves its members.

Indeed, a most welcome trend for the aviation press which has had little recourse but to turn its back on IAS through sheer lack of cooperation. We have one simple suggestion for Dr. Stever: simply match the SAE in press services and all will be well again in this area.

**Fast work**—Ray Dunn's engineering and maintenance force at TWA, with some fine cooperation from Boeing, did

a remarkable job in rehabilitating the first 707 that made the belly landing at Idlewild some time ago.

Only 21 hours after the landing it was in the wash dock and six hours later in the hangar. After several days' inspection and repair planning, two crews working 12-hr. shifts changed the entire gear, the No. 2 and 3 engines and engine struts, the keel beam in the wheel well and entire delta beam in the belly. TWA had the airplane on test flight in 27 days.

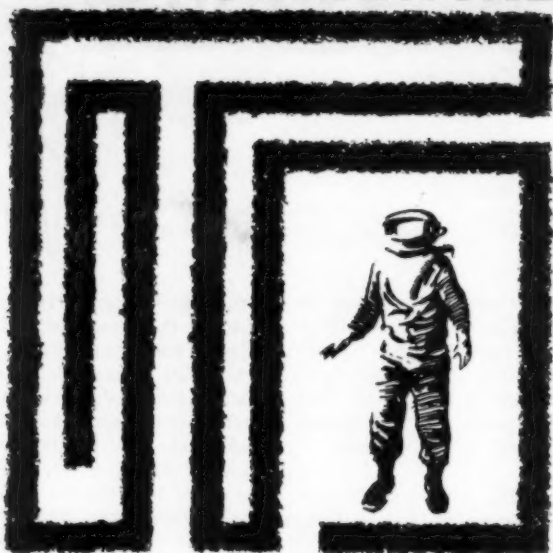
For those faced with future belly landings, it took 15,357 manhours and involved replacement of 14,400 ft. of wiring, 730 wire splices and 85 different resistance and continuity checks.

**Lighting economy**—Sweden's Board of Civil Aviation claims a 90% saving over U.S.-favored systems for its Viktor touchdown lighting installation tested out at Malmo-Bulltofta Airport. Named for inventor Viktor Svensson, it provides "white" touchdown area by means of angled side lights.



NOW, A FIVE-ENGINE DC-8. FAA has certified "fifth pod" installation shown here for use by airlines to carry a spare engine to a remote station in event of a failure. Eleven DC-8 operators have made provisions to carry the pod.

# ENVIRONMENTAL



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**BREATHING LIFE INTO AIR AND SPACE TRAVEL**

### WAL Takes 'On Time' Lead

Western Air Lines topped the U.S. trunks in "on time" performance during December, 1960. Its 78.6% was a shade ahead of Braniff in second place. Continental led jet operators with 81.8% on time with TWA and American filling the second and third spots respectively.

#### ON-TIME BOXSCORE

DECEMBER, 1960

Airline Ranking

On time to  
15 min. late

#### TRUNKS

1	Western	78.6 %
2	Braniff	78.4
3	United	75.5
4	TWA	74.5
5	American	73.83
6	Continental	73.81
7	Eastern	71.8
8	Capital	70.0
9	Delta	67.7
10	Northeast	65.6
11	Northwest	63.3
12	National	62.3

#### 707 & DC-8

1	Continental	81.8 %
2	TWA	72.0
3	American	69.1
4	Braniff	63.3
5	United	63.1
6	National	62.9
7	Delta	61.8
8	Western	61.0
9	Eastern	54.8
10	Northeast	50.7

#### 720

1	United	75.9 %
2	American	65.9

#### 880

1	Delta	49.6 %
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#### ELECTRA

1	Braniff	87.8 %
2	Eastern	64.7
3	Western	64.3
4	American	62.8
5	National	57.6
6	Northwest	44.9

#### LOCAL SERVICE

1	Piedmont	86.2 %
2	Bonanza	83.7
3	West Coast	82.7
4	Frontier	82.4
5	North Central	78.2
6	Central	73.3
7	Ozark	71.1
8	Allegheny	68.7
9	Southern	65.1
10	Lake Central	64.3
11	Mohawk	60.0
12	Pacific	57.9
13	Trans-Texas	46.9

Nonstops and one-stop flights only  
SOURCE: AIRLIFT Research

Correction: TWA's "on time" performance for jets (AIRLIFT Feb., page 50) was shown as 62.22% in 8th place. It should be 81.27% placing it in No. 3 position for the month of October, 1960.

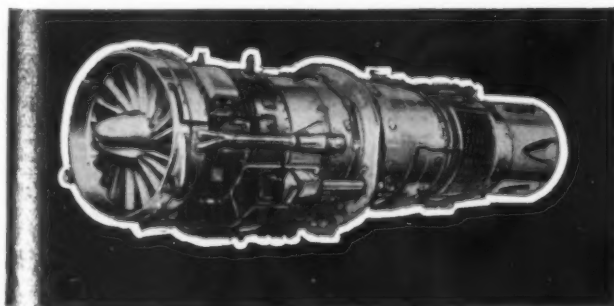
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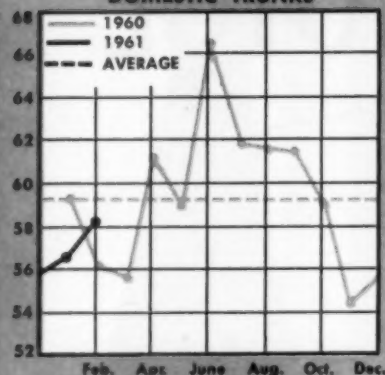
**ROLLS-ROYCE LIMITED, DERBY, ENGLAND**

**AERO ENGINES • MOTOR CARS • DIESEL AND GASOLINE ENGINES • ROCKET MOTORS • NUCLEAR PROPULSION**

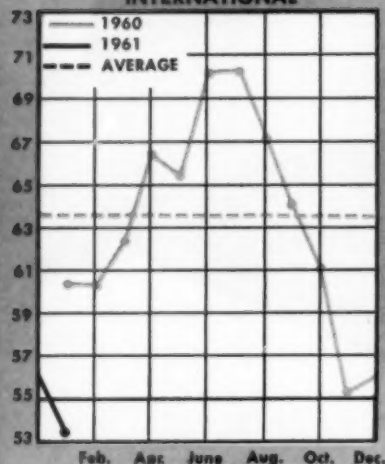
# HOW'S TRAFFIC Among U.S. Airlines \*

## PASSENGER LOAD FACTORS 1961 VS. 1960

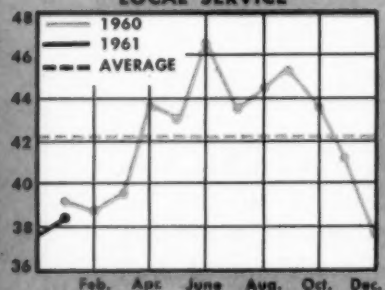
### DOMESTIC TRUNKS



### INTERNATIONAL



### LOCAL SERVICE



\* In this issue, AIRLIFT introduces major changes in reporting of statistics: Traffic tables (right) now reflect a ranking of airlines in lieu of alphabetical listing. Graphs (above) will be varied to deal with such topics as first-class vs coach trends, and how airlines share the market, respectively.

# U.S. Airline Traffic for January 1961 vs. 1960

This complete summary compiled by AIRLIFT Magazine from Official CAB data

Revenue Passengers (000)				Revenue Passenger Miles (000)					
	1961	1960	% Change		1961	1960	% Change		
DOMESTIC									
EAL	626	698	-10.3	AA	490,332	508,492	-3.6		
UAL	626	513	22.0	UAL	461,566	352,187	31.1		
AA	620	655	-5.3	EAL	352,737	390,822	-9.7		
TWA	371	404	-8.2	TWA	334,764	368,085	-9.1		
DAL	303	268	13.1	DAL	177,738	148,884	19.4		
CAP	272	274	-0.7	CAP	119,329	118,590	0.6		
BNF	181	175	3.4	NAL	97,135	103,836	-6.4		
WAL	128	151	-15.2	BNF	86,138	81,206	6.1		
NEA	115	104	10.6	WAL	76,606	87,261	-12.2		
CAL	107	112	-4.4	CAL	70,727	78,058	-9.4		
NAL		Not Available		NEA	50,592	50,646	-0.1		
NWA		Not Available		NWA		Not Available			
	3,349	3,354	-0.1		2,317,644	2,288,087	1.3		
INTERNATIONAL									
PAA	233	232	0.4	PAA	371,949	365,874	1.7		
LAD	94	117	-19.7	LAD	112,287	138,125	-18.7		
ATL	100	82	21.9	ATL	124,752	121,052	3.0		
PAC	35	29	20.7	PAC	130,018	102,760	26.5		
ALA	4	4	...	ALA	4,892	3,937	24.3		
EAL Total	46	35	31.4	EAL Total	72,228	52,784	36.8		
SJU	39	29	34.5	SJU	59,822	44,849	33.4		
BUR	1	2	-50.0	BER	1,139	1,248	-8.7		
MEX	6	4	50.0	MEX	11,267	6,687	68.5		
CBA	34	32	6.3	TWA	52,340	46,683	12.1		
TWA	20	15	33.3	UAL	27,216	14,960	81.9		
UAL	11	6	83.3	PGA	16,638	15,267	9.0		
PGA	10	10	...	BNF	11,593	7,127	62.7		
AA	8	11	-27.3	WAL	5,886	8,583	-31.4		
BNF	7	4	75.0	AA	7,894	11,515	-31.4		
WAL	4	6	-33.3	NAL	852	3,720	-77.1		
DAL	1	3	-66.7	DAL	2,054	3,996	-48.6		
NAL		Not Available		CBA	2,419	2,273	6.4		
NWA		Not Available		NWA		Not Available			
TRC		Not Available		TRC		Not Available			
	374	354	5.6		571,069	532,782	7.2		
LOCAL SERVICE									
NOR	84	71	18.3	NOR	15,430	12,536	23.0		
AAA	53	34	55.9	AAA	10,870	6,129	77.4		
MOH	51	42	21.4	MOH	10,277	8,283	24.1		
OZA	44	36	22.2	OZA	7,924	6,344	24.9		
PAC	32	37	-13.5	PAC	7,589	8,440	-10.1		
PAI	31	31	...	WCA	7,581	7,282	4.1		
WCA	29	30	-3.3	FAL	7,339	6,636	10.6		
SOU	28	21	33.3	PAI	6,525	6,748	-3.3		
FAL	27	25	8.0	TTA	5,485	5,363	2.3		
TTA	23	23	...	BAL	5,339	5,009	7.0		
LCA	21	17	23.5	SOU	4,994	3,893	28.3		
BAL	21	20	5.0	LCA	3,187	2,590	23.1		
CEN	13	12	8.3	CEN	2,640	2,414	9.4		
	457	399	14.5		95,180	81,667	16.5		
HELICOPTERS									
CHA	22	19	15.8	CHA	357	330	8.2		
NYA	10	10	...	NYA	228	199	14.6		
LAA	3	3	...	LAA	123	102	20.6		
	35	32	9.4		708	631	12.2		
INTRA HAWAII									
HAL	31	42	-26.2	HAL	5,407	8,478	-37.7		
Aloha	24	27	-11.1	Aloha	3,427	4,276	-19.9		
	55	69	-20.3		8,834	12,954	-31.8		
ALASKA									
PNA	10	7	4.3	PNA	9,833	6,289	56.4		
Alaska	9	9	...	Alaska	9,687	9,248	4.7		
ACA	3	3	...	Reeve	1,042	896	16.3		
ELS	3	4	-25.0	NCA	378	358	5.6		
Wien	2	1	100.0	Wien	349	392	-10.9		
COA	1	1	...	ACA	328	297	10.4		
NCA	1	1	...	ELS	174	229	-24.0		
Reeve	1	1	...	COA	212	212	-0.5		
	30	27	11.1		21,907	17,921	22.2		
ALL CARGO									
(Ton miles in thousands)									
	Freight			Total Scheduled			Total All Services		
	1961	1960	% Change	1961	1960	% Change	1961	1960	% Change
FTL	5,241,353	6,757,693	-22.4	5,338,589	6,882,651	-22.4	10,922,395	10,999,922	-0.7
SEW	1,974,451	1,952,154	1.1	3,021,874	2,423,453	24.7	3,226,060	4,636,012	-30.4
RID	1,580,646	1,830,508	-13.6	1,642,615	1,877,315	-12.5	3,495,118	1,933,926	80.7
ASA	112,942	473,235	-76.1	112,942	473,235	-76.1	191,054	558,250	-65.8
SLI							2,697,466	6,460,380	-58.2
	8,909,392	11,013,590	-19.1	10,116,020	11,656,654	-13.2	20,532,093	24,588,490	-16.5

# 999,000 BUSINESSMEN WILL READ THIS NEWS ABOUT LOCAL SERVICE AIRLINES\*

## News of Local Service Airlines

Texaco offers this series of informative bulletins in recognition of the vital new dimension being added to business activity by local service airlines. Texaco Inc., Aviation Sales Department, 135 East 42nd St., New York 17, N. Y.

They've already read ads like this in past issues of *Business Week*. And they'll be reading new ads in future issues—all telling them how Local Service Airlines are contributing to American business activity.

Texaco, who supplies many of these airlines with a full line of fine aviation fuels and lubricants, is pleased to present this series in the public interest.

\*Based on an average readership of 2.7 per copy of *Business Week*.

### Roster of local service airlines

Alaska  
Alaska Coastal  
Allegheny  
Aloha  
Bonanza  
Caribair  
Central  
Cordova  
Ellis  
Frontier  
Lake Central  
Mohawk  
North Central  
Northern Consolidated  
Ozark  
Pacific  
Piedmont  
Reeve Aleutian  
Southern  
Trans-Texas  
West Coast  
Wien Alaska

**Special local transport airline flights make unusual contract obligations possible.** Thanks to flexible local transport airline facilities, business men now often find it possible to fulfill contract obligations in a manner unheard of a generation ago.

Take the huge Ballistic Missile Early Warning System that RCA is building for the Defense Department. Since the project is near Fairbanks, Alaska, close communications with company headquarters posed a problem.

The solution was found when RCA contracted Alaska Airlines to operate a once-weekly round-trip flight service between Philadelphia and Fairbanks. Flights involve 6,866 round-trip miles per week . . . a total of over 300,000 miles for the year. Cargo includes both men and materials.

**Air freight expands to include direct ground link.** Local service airlines make it possible to fly freight into practically any city in the U.S. Last year, local carriers moved over 5 million tons of air freight—a 200% increase over 1950.

Now, shippers in the Arkansas-Louisiana-Texas area can take advantage of a new convenience offered by Trans-Texas Airways. On May 1, the Railway Express Agency began door-to-door pickup and delivery for Trans-Texas—a direct ground link for their air freight traffic.

**Local carrier "watch dog" service protects nation's timber stands.** Stranded vessels have been saved. Strayed livestock recovered. Fishermen rescued. Power line breaks discovered. All because of the vigilance of local carrier flight crews. But perhaps the most valuable "watch dog" service these men perform is detecting and reporting forest fires.

Pacific Air Lines flights, for instance, cover 26 national forests as well as many of the nation's most valuable stands of timber. Last year, Pacific flight crews alerted state and national forest firemen to fires in many areas—thus helping prevent the loss of millions of dollars worth of standing timber.

**Local carriers offer exciting vacation tips for the time- and budget-conscious.** Because they cover the entire United States, local service airlines offer almost unlimited vacation possibilities. Skiing, skin-diving, sightseeing, bull-fight attending—to name just a few. Vacation planners find local carrier facilities especially helpful in planning short or inexpensive vacations. Bonanza Airlines flies vacationers to all the scenic wonders and famous winter resorts of the Southwest—including fabulous Las Vegas. Trans-Texas Airlines schedules week-end flights at special rates to the colorful old cities of Laredo and Nuevo Laredo. Or, for something different, travelers can get a breathtaking view of the Hawaiian Islands from Aloha Airlines sightseeing planes. Special lens windows let shutterbugs take undistorted shots of nature's grandeur below.

Central Airlines offers perhaps the shortest vacation on record. As part of its regular service, it schedules 20-minute, Sunday afternoon "Scenic Flights" over the 36 cities in its area. The cost? Just \$2.50.

TEXACO INC., AVIATION SALES DEPARTMENT, 135 EAST 42ND STREET, NEW YORK 17, N. Y.



Northrop's Laminar Flow Control will enable large aircraft to fly up to twice as far as they now can, and stay aloft proportionately longer, on the same amount of fuel. Or it will permit them to carry heavier payloads over a given distance. And it will accomplish this without increasing the airplane's size, weight, or engine power.

Laminar Flow Control is a revolutionary technique developed by Northrop for reducing friction drag on an

airplane in flight. This drag is caused by the turbulence of the boundary layer of air as it flows over the surfaces of the plane. By drawing off this turbulent air through paper-thin slots in the aircraft skin with a suction system, and exhausting it in the direction of thrust, a smooth "laminar flow" of air is obtained.

The implications of Laminar Flow Control are far-reaching. To commercial operators it can mean substantial cost savings on long distance flights, and make



## More sky per gallon

possible non-stop flights over greatly increased distances. To the military, it will be immensely important for surveillance and airborne alert missions, or for any operation requiring aircraft to stay aloft over long periods. On logistic missions, planes can fly in and out of trouble spots without refueling. Dependence on overseas bases will be reduced.

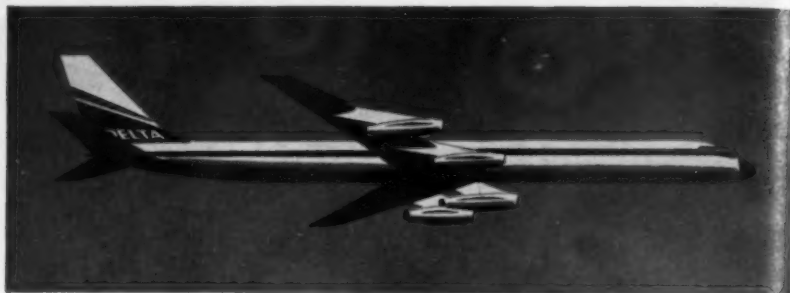
Northrop is conducting a continuing research program for the U.S. Air Force to investigate the applica-

tions of Laminar Flow Control to many kinds and phases of flight. Two airplanes are now being modified under a separate Air Force contract to demonstrate the practicability of this new aerodynamic technique in day-to-day operation.

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# DELTA

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# Electra Changes Lift Speed Limit

After 12 months of the most extensive technical investigation a new transport has yet undergone, the Lockheed Electra turboprop is being readied to shift forward into its normal 400-mph cruise speed.

Electra operators, now in their fourth month of returning the turboprops to the Lockheed factory, are awaiting only fleet completion before re-scheduling flights at higher speeds.

Northwest Airlines has decided to accept the eight new Electras which had not been delivered at the time the speed reduction was imposed. It will have the "fast" schedules in effect on April 1.

Eastern, biggest of Electra operators with 39 aircraft, is renaming them "Super Electras." American and Western will call them Electra IIs, Northwest uses "prop-jets," National and Braniff have not decided on a new name yet.

## Eastern unveils the Super

As part of an overall Lockheed airline master plan aimed at restoring public confidence in the turboprop, Eastern Air Lines introduced the Super Electra to the press recently on a New York-Tallahassee-Miami flight. Operating at speeds well above the 259-mph limit imposed by FAA, the modified airplane demonstrated its ability to slice about 45 minutes flying time from the average 1000-mile segment.

In New York-Miami service, one of the longest nonstops flown by Electras, the time will be reduced from about 4 hrs. now to the 3 hrs. 15 min., in effect before the slowdown.

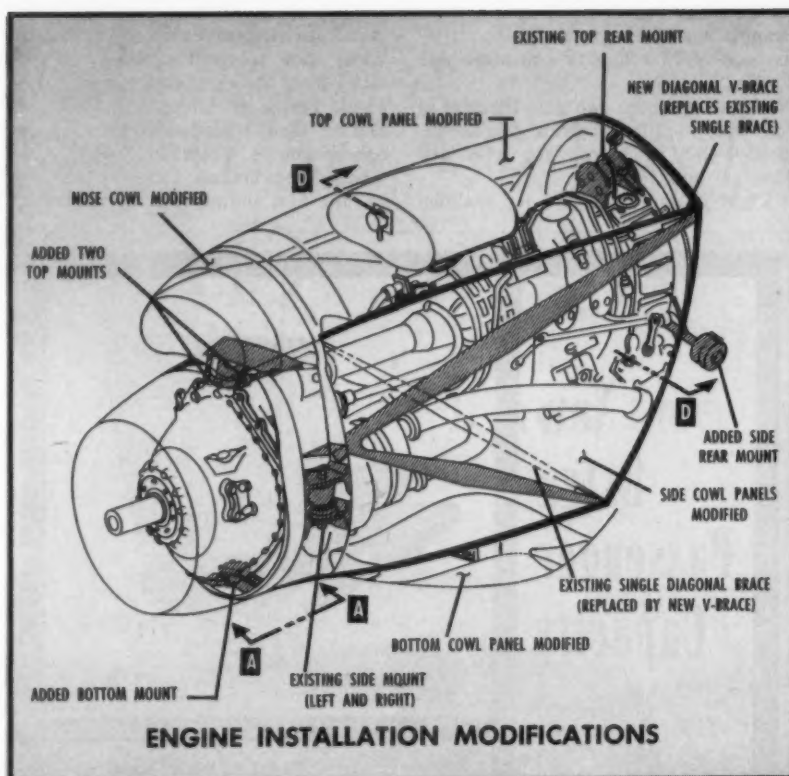
The Electra rework (see sketches) involves about 20 describable fixes plus a number of miscellaneous items. For the most part, all are directed at stiffening the wing, nacelle, powerplant or gearbox installation.

As a result of the changes, empty weight is increased by 1407 lbs., but an increase of 1590 lbs. in zero fuel weight offsets the effect of the added poundage. The new zero fuel weight becomes 82,500 lbs.

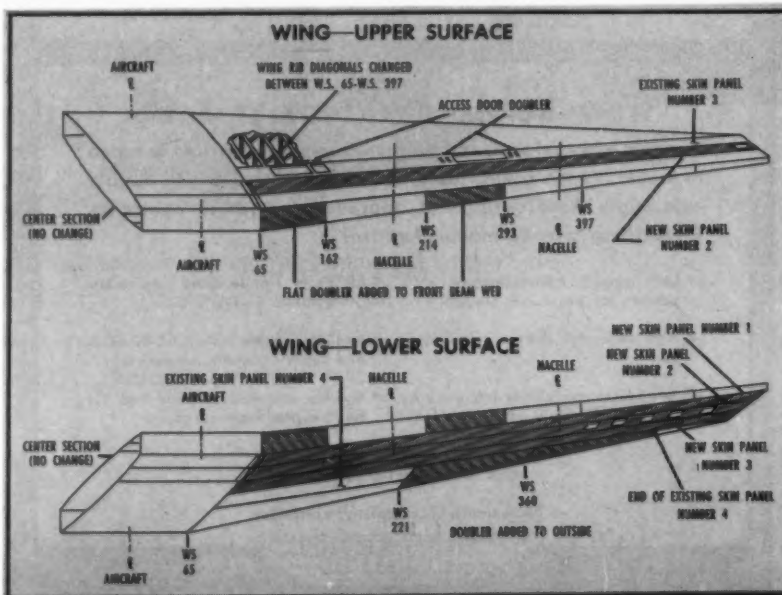
## Who gets what . . . when

Here's how the various carriers stand on fleet rework:

**Eastern:** expects to have its entire 39 aircraft modified by late July with deliveries monthly as follows: Jan. (3); Feb. (4); March (6); April (5); May (7); June (11) and July (3).



THE NEW LOOK inside the Electra's engine installation. Most significant changes affect the engine and gear box mounting, including new mounts and "V" brace.



WING BEEF-UP involved changes to skin panels top and bottom. Among internal wing modifications was a shift from rivets to HiLok fasteners for rib clip attachment.

**American:** had 20 modified by the end of March. Receives six each in April and May and its 33rd aircraft in June. **Northwest:** had six reworked by the end of March and is due two in April and one in May.

**Western:** received three in February and will get last three of original order for 12 on or before April 30.

**Braniff:** had received seven aircraft by the end of March with one more due April 12.

**National:** accepted two new Electras in Jan. with modified aircraft due as follows: Feb. (1); March (1); May (3); June (4) and July (3).

KLM is due to receive its modified

Electras (12) by mid-May and all fleets of 14 airlines using the Lockheed turboprop will be reworked by July 1961.

## AIRLIFTS

• **Members of the American Association of Airport Executives** got a jolt when they received promotional material from the alert, convention-getting traffic people of United Air Lines soliciting their business to their annual convention in Colorado Springs April 22-25. The United literature referred to "the 61st annual convention," which

would mean that the airport outfit was organized three years before the first powered airplane ever flew! Actually, AAAE is holding its 34th annual meeting.

• An "oscar" for ingenious travel advertising is due South Pacific Air Lines for an ad captioned, "Coffee, tea or cocoanut milk?"

• **What can a station agent** do when an air cargo shipment arrives minus a shipping tag? This situation recently confronted an agent in Chelmsford, Mass., who unloaded a two-month-old bulldog, air shipped from San Antonio, only to find the hungry canine had digested his shipping tag. Fortunately, the name of a Chicago mail order house remained stamped on the carton, and a bit of long distance sleuthing soon unearthed the name of the intended recipient.

• **New FAA Administrator Halaby** is no newcomer to Washington, and he daily runs into people he met some years ago when he was vice chairman of the White House Aviation Facilities Study Group. Inquiring as to his present role in government, friends often are puzzled when he mentions FAA by initials or spells it out. He soon learned, however, to identify himself as "Que-sada's successor." "Oh, yes," his colleagues remark, then usually add, "You poor guy."

• **The story is old**, but it still happens. Two cello players recently flew Delta, purchasing half-fare tickets to accommodate their bulky instruments in the seat beside them. Come flight time, the passengers boarded, with instruments. But airline agents counted two fewer heads than their passenger lists disclosed. So the P.A. system soon was pleading for a Mr. and Mrs. Cello to please take their seats.

• **An oilless bearing** now being offered in the U.S. as the last word for freedom from maintenance, has been dubbed "DU" by its manufacturer, the Glacier Metal Co. of Great Britain. Legitimate enough, so far as cataloging is concerned, but the initials actually serve a descriptive purpose. When pressed, Glacier engineers concede that they are an engineeringese contraction for "damned ultimate."

• **Delta Air Lines** ticket agents relate an intriguing tale about a really conscientious potential passenger who went out on a limb to avoid being listed as a no-show. Fifteen minutes before departure he telephoned, "Better cancel my reservations, I'm in trouble." And so he was. Later that day the Delta agent read a newspaper account of the customer's flight from, and eventual capture by, the local police.

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*Wayne Parrish reports to the travel industry:*

## "Travel Sales Gems to be Mined in COLOMBIA!"

It is too bad that many Americans think only of coffee (the finest in the world) when Colombia is mentioned. Colombia offers much more than that!

For example, while travelers to other parts of South America must be content with bringing home mere gold and silver, Colombia tourists can acquire some of the world's finest emeralds — right at the source. Colombia is a world center of emerald production, and the quality of many of the stones is considered by jewelers to surpass all others. (Emeralds are a government monopoly; the tourist who deals with authorized jewelers is sure of getting an outstanding value.)

But those who know Colombia say the true jewels of the country are its people. I don't believe any city contains

(besieged by Sir Francis Drake in 1585) on back into the mountains.

It is fitting that Bogotá should have such attractive people, because they must compete for attention with an incredibly luxuriant flower display.



Cartagena: bell tower of San Felipe Fortress. Here, the walls are so massive their tops are used as thoroughfares.

Colombia, you see, is the land of orchids, where blooms that could well sell for \$10.00 apiece in America, are given for a smile. (Really fine blossoms may cost all of a dime.)

What about Colombia's history? It was in Colombian ports that the Vice-roys of the Sea held sway; and it was from these ports that many of the galleons set sail for Spain crammed with gold ingots, riding deep in the water. This, too, was the coast where the freebooters and buccaneers sailed impudently under the very muzzles of Spanish guns, looting galleons and raiding shore settlements now and then.

To return to the modern setting, Colombia is a wonderful place for resort accommodations. Anyone who thinks of South American hotels and tourist resorts as primitive relics of the 19th Century should visit the luxury hotels in the northern beach areas, or nest for a while in the new skyscraper

hotels in Bogotá. (They'll change their tune in no time.) As for convenience — Bogotá is merely three hours out of Miami. You can have dinner in Bogotá after a comparatively late start in New York. It takes only a little more time from Chicago, or even from the West Coast.

So here's another spot where you can sell everything, from the beauty of gems prized above diamonds to the beauty of a tropical paradise. By jet they're nearer in time than most comparable resorts in the United States. They are also nearer in terms of money, too, for the new air fares are so reasonable that a person can afford a trip to Bogotá as easily as to drive a thousand miles to and from a domestic resort.

We are constantly impressed by Wayne Parrish's first-hand knowledge of the Latin American countries Braniff serves. He couldn't hope to tell you all about them (each one deserves a volume), but he certainly gets a good start on it.

Colombia is a good example. We have been flying down to this jewel-like vacationland for years. And our jewels — our magnificent El Dorado Boeing Super Jet flights — are scheduled to help you arrange vacation trips that really sell. (And make your clients feel mighty valuable, on the way.)

Let Colombia's beauty and Braniff's experience help you. For details on tour possibilities in Colombia, write: Braniff International Airways, Tour Department, Exchange Park, Dallas 35, Texas. (And if you haven't gotten your copy of our complete tour folio, "El Dorado Holidays," be sure to ask for it.)

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# AIRWAYS

AIRLIFT



The stately Cathedral of Bogotá — with just a suggestion of the spectacular mountains surrounding the city.

more beautiful women per square block than Bogotá. This is not to say that all South American cities are not distinguished for feminine loveliness. Bogotá is just exceptionally blessed. So is the rest of Colombia — from seacoast Barranquilla (quite modern, bustling) and walled, history-laden Cartagena

# RCA Aims For Altitude Provision in Transponders

By **PHIL GERACI**

Incorporation of automatic altitude reporting circuitry within the same box housing the transponder is a feature of RCA's AVQ-60 series of radar beacon transponders, 51 of which were recently ordered by United Air Lines for installation in Caravelles and Boeing 720 aircraft.

The RCA approach represents a saving for operators just now equipping with transponders. Many earlier models were built without altitude reporting provisions. The purchase of an additional "black box" to fulfill this function could cost as much as \$1500. RCA's "internal provision" tactic will reduce this figure to around \$300.

The RCA transponder closely follows the form factors laid down by ARINC 532-C, except for the supplementary altitude reporting box. Two models are available—AVQ-60B, designed to operate with only three-pulse sidelobe suppression (in the U.S.) and the AVQ-60C, a combined version which will respond automatically to either two or three-pulse interrogations. The AVQ-60C will be required by carriers operating out of the U.S.

Flexibility is provided in the form of a conversion kit to transform the AVQ-60B into an AVQ-60C. The conversion requires about four hours bench time, and can be done either by RCA or by operators who prefer to use their own facilities.

Components involved in the conversion are resistors, capacitors, transistors and two short pieces of delay line.

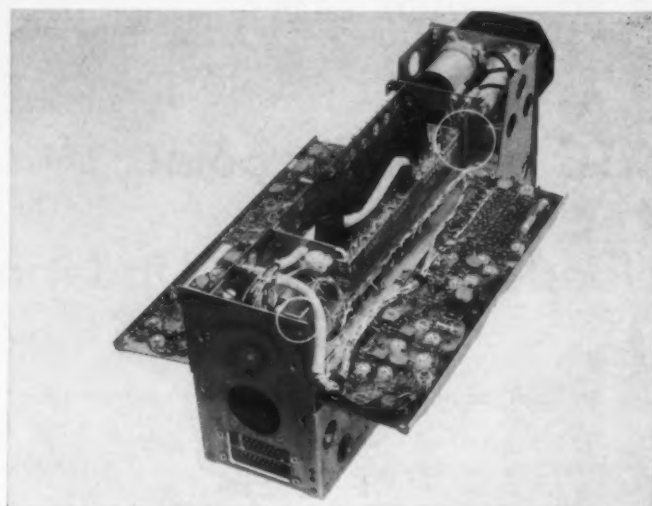
The other significant conversion, to

accommodate automatic altitude reporting, will be accomplished by inserting an additional printed circuit board into a blank space (see photo) which runs the length of the transponder chassis. The exact form this PC board will take is not known. FAA still is deliberating and the decision probably will not be announced for some time.

Weight of the AVQ-60B is 22 lbs. The C model weighs one pound more. Size is ½ ATR. Fourteen tubes and 37 transistors are used. Transmitter power output is adjustable from 250

watts to 1000 watts. Number of reply codes: 64, with a capability of expansion to 8192.

John Whitehead, RCA sales manager for aviation equipment, reports a project is under way for design of a lighter, more compact transponder for airlines and executive operators who fly only within the continental U.S. It will be designated AVQ-65. Cost will be considerably less, although it will be designed to do virtually the same job as the larger, heavier AVQ-60 series. ■



*AUTOMATIC ALTITUDE reporting can be accomplished by installing printed circuit board in space provided between circles.*



*RCA AVQ-60 transponder permits either two or three-pulse side-lobe suppression. Above is 22-lb. AVQ-60B designed for airlines.*



# ATC Snafus Pinpoint Need for System Updating

by Capt. Larry Shapiro

**Flight 178:** "Control Center from Flight 178. Did you see that F86 that just passed in front of us?"

**Control Center:** "Stand by 178"

Three miles (20 seconds) later: "I see him now 4 o'clock your position."

**Flight 178:** "Why didn't you see him before?"

**Control Center:** "I momentarily lost radar contact with you and had to hand off two other aircraft to approach control. By the time I returned to you he had passed."

Conversations such as the above are taking place every day on our airways. By compiling tape recordings of such conversations I have gathered reams of data which testifies to the inadequacies of our traffic control. The following are a few typical conversations encountered every day by thousands of pilots. A critical analysis of each, in my opinion, demonstrates the urgent need for some new thinking by those who are about to blueprint the course that will be followed in the coming years.

**Radar Controller:** "Flight 211 you're coming over the antenna, unable accurate radar advisory service for about 20 miles. Over."

**Flight 211:** "Roger. Could you explain to us what the limitations are here, in regard to your equipment?"

**Radar Controller:** "Roger. Ground clutter varies a good deal from 20 to 40 or 50 miles in all directions, we have very poor luck on radar, holding targets (in this area). Near the antenna, within 15 or 20 (miles) and sometimes further out these targets will cause rings. Right now your target is 8 miles from the antenna and it is making about a 30 degree ring. Sometimes it is 360 degrees. If there are any number of targets around the antenna, it is impossible to keep track of one in respect to the others. There is a dead blind spot over the antenna. At times I have seen targets come out from the antenna that

show right up in front of one of the airplanes."

**Radar Controller:** "That's the reason for our limitation calls."

**Flight 211:** "Roger. How far off the airway is the antenna?"

**Radar Controller:** "You passed within 8 miles of it. Over."

\* \* \*

**Radar Controller:** "American 48, I did give you one transmission that was meant for United 858 . . ."

\* \* \*

**Flight 703:** (To radar controller): "How many targets do you pick up that are not beacon equipped? What percentage?"

**Radar Controller:** "About 40% of them."

An analysis of the above conversations clearly illustrates the equipment and human limitations existing with ground control radar. It is not uncommon for a radar operator to be controlling six aircraft at one time—sometimes as many as 9 or 10 aircraft are under surveillance.

When a controller gives his attention to one aircraft, all others are neglected. It only takes a jet fighter 2 minutes to cross one of our positive control airways. Since some radar control operators only see approximately 40% of the military traffic crossing positive control airways and cannot give 100% attention to each aircraft, the limitations of our present system are obvious.

**Automation:** Many think that automation of ground control radar is the answer. The amount of money that could be invested in automation is frightening. Air traffic controllers are constantly making decisions based on judgment and past personal experiences. Until a machine is perfected that has the capacity for decision based on reasoning, is flexible and can improvise, using not only facts immediately available, but those of years of exposure to similar problems, then and only then would automation be feasible.

Considerable delay could be avoided

by applying technical know-how now available. If all military aircraft crossing our airways were required to have their transponders on at all times and were equipped with a transmission output meter, the 60% of such aircraft which do not now show up on some radar would be visible for traffic separation.

**Airborne Radar:** Mr. F. M. McDermott, executive director of the Air Traffic Control Association, in an article published by ALPA, shortly after the recent New York collision, stated that an airborne collision avoidance system "is not sound, and efforts toward this end are not likely to contribute toward a safe and efficient system of air traffic control."

In my opinion, an airborne radar collision avoidance system is an absolute must to minimize the exposure to mid-air collision. This cannot be done by ground radar alone. Such airborne equipment may not increase the number of controllers in Mr. McDermott's association but it certainly will make flying safer.

If others take up Mr. McDermott's position, we will be faced with a battle between the advocates of 100% ground control and those who advocate an airborne CAS (collision avoidance system).

This should take us all back a few years when factions within our industry publicly battled ILS vs GCA. We found that the safest and most desirable solution to the difference that existed then was the use of both systems to complement each other.

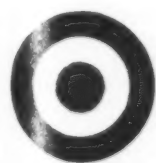
The same is true in airborne vs ground radar. Neither is adequate by itself . . . both are needed. This was the opinion of the airlines immediately after the Grand Canyon collision several years ago. At that time ATA wrote specifications for a CAS and signed a contract with one major electronic manufacturer for its development. After approximately one year of research, the manufacturer abandoned the project, stating that the specifications could not be met.

Fortunately, several groups have been working behind the scenes without publicity or fanfare in the development of suitable airborne equipment. Such equipment is composed of four components: computer, amplifier, transmitter-receiver and antenna. The stumbling block in the development has been the antenna.

It appears that the Sperry Gyroscope Company has overcome all technical obstacles with their recently announced "Luneberg Lens" antenna which looks like an inverted plate 11"—16" in diameter and 3/16"—5/16" thick which flush mounts on the bottom of the fuselage.



# ARGOSY C. Mk.1



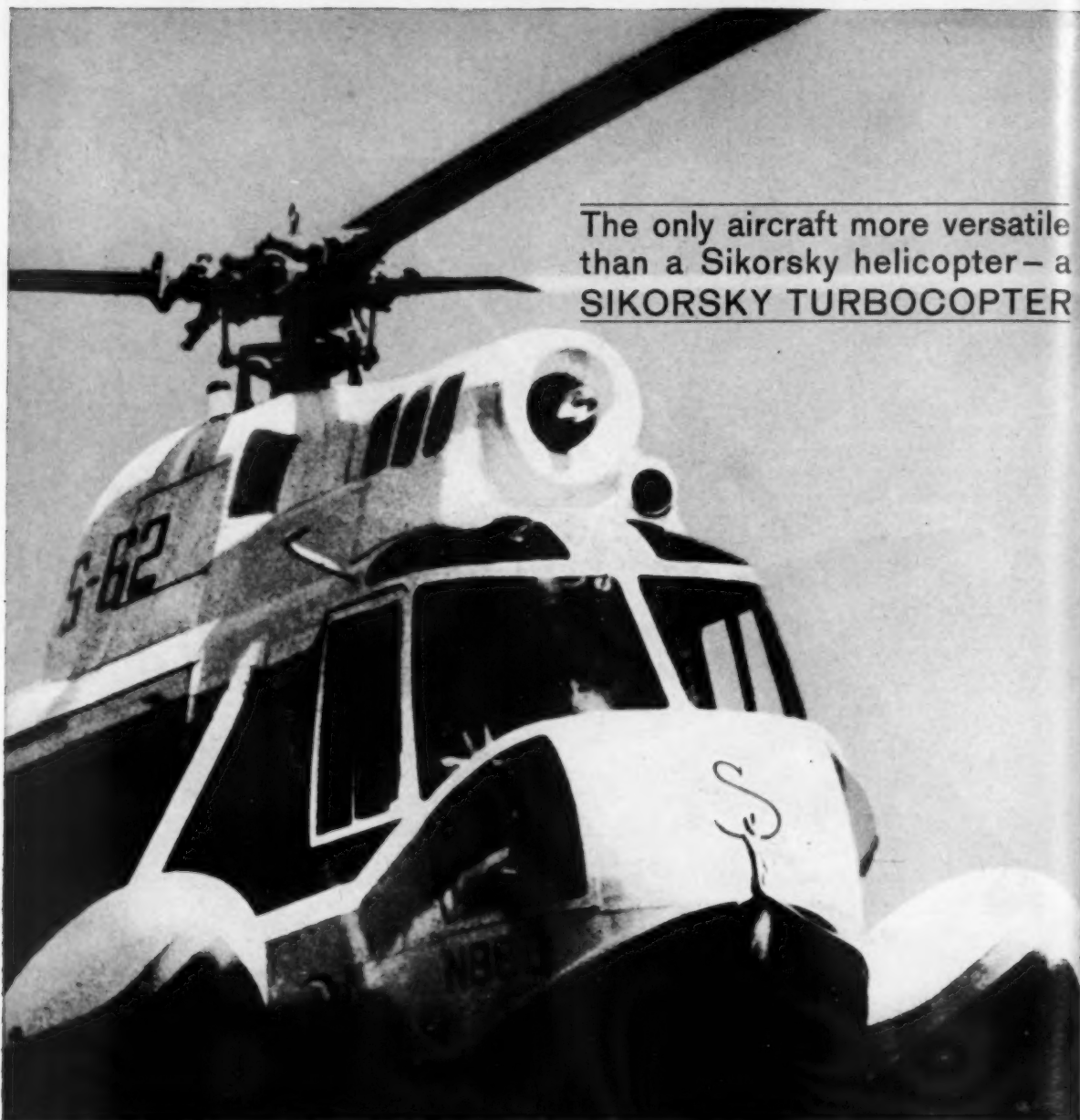
Choice of Transport Command

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APRIL, 1961

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DOW

## IN THE AIRLINES

**Herman J. Abs** succeeds **Dr. Kurt Weigelt** as chairman of the board of Lufthansa.

**Albert E. Blomquist**, transportation consultant for the past 15 years, appointed executive v.p. of Icelandic Airlines. **Sverre Marcussen** promoted from U.S. sales mgr. to v.p. **Theodore van Schelven**, who has been asst. to the president, named U.S. sales mgr.

**George Sztybel**, formerly in charge of U.S. cargo sales development for KLM, named to newly-created post of U.S. supervisor of commercial planning.

Special meeting of TWA stockholders elected six new directors: **Ernest R. Breech**, former chairman of Ford Motor and one of the voting trustees of TWA stock; **George R. Brown**, of Herman Brown and George R. Brown Engineering and Investments, Houston; **Clifford F. Hood**, former president of U.S. Steel; **Barry T. Leithhead**, president of Cluett, Peabody & Co.; **Hughston M. McBain**, former chairman of Marshall Field; **John A. McCone**, chairman of Joshua Hendy Corp.

TWA directors re-elected were: **E. O. Cocke**, **Raymond A. Cook**, **Oscar Holcombe**, **Raymond Holliday**, **A. V. Leslie**, **Sidney Maestre**, **M. E. Montrose**, **Warren Lee Pierson**, **Harry E. Rogers**, **Ben-Fleming Sessel**, **T. A. Slack**, **Lloyd Wright**.

Promoted to assistant vice president at Northeast: **John V. Auskalis**, in charge of quality control; **Frank C. Barker**, communications; **Arthur A. Brennan**, personnel; **Maurice DeGroff**, traffic; **J. O. Urquhart**, passenger service; **Harry F. Zimmerman**, finance.

**Thomas F. Armstrong** retires as executive v.p.-finance of Eastern, after 33 years service. He was EAL president for six years, relinquishing the post in 1959 because of illness. Armstrong will serve as a special consultant on finance.

**George T. Cussen**, who has been Flying Tigers' v.p. for Pacific and Northwest regions, appointed v.p. in charge of interline air freight development.

**E. Smythe Gambrell**, long-time counsel for Eastern, elected a director and member of the executive committee.

**Oliver F. Stern**, formerly with Argentina's TSA/Transcontinental, and AAXICO, named cargo services mgr. of Eastern, assuming duties of **W. J. Wilhelm**, who is on extended leave for corrective surgery.

**S. S. Brunt**, Piedmont's supt. of passenger service, appointed director of customer relations. **H. L. Warner**, sales mgr. in eastern North Carolina, named director of flight services.

**James A. Kennedy** promoted by United from community relations mgr. of Rocky Mountain region to system director of publicity, Chicago. **Richard C. Fernald**, mgr. of publicity production, named asst. director of publicity.

**Jack Howe**, asst. to the v.p.-traffic and sales of Trans-Texas, appointed director of public relations. Bill Newkirk & Associates continue as consultants.

**Robert Christian**, Atlanta newspaperman, named news bureau mgr. of Delta.

**Norman S. Rice** promoted by American from staff mgr. for aircraft operating procedures to director of technical training.

**Roger B. Ulvestad**, transportation and marketing instructor at University of Washington and UCLA, named special asst. to the president of Flying Tigers, to work on tariff structures and marketing research.

**Larry Decker** promoted by Bonanza from general sales mgr. to v.p.-traffic and sales, replacing **William J. Mitchell**, who resigned to join Mohawk.

**Edward O'Brien Fennell**, regulatory attorney with United in Chicago, named community relations mgr., Washington, D.C.

**George N. Gardner**, educational director of Pan American, will receive the 1960 Frank G. Brewer Trophy, awarded annually by National Aeronautic Assn. to the individual or organization contributing most to development of youth in the fields of aviation and training.

**Max A. King**, v.p. of Pacific, formerly responsible for public relations and sales, will now devote full time to customer, community and government relations work. **Robert J. Dixon**, former sales promotion mgr. of Pan American's Overseas Div., appointed to new post of director of sales and advertising.

## AMONG THE SUPPLIERS

**J. V. Nalsh** resigned as senior v.p. of General Dynamics and president of its Convair division. Reason: "Amicable but irreconcilable differences in management philosophy." He did not announce future plans. **C. Rhoades MacBride**, executive v.p. of General Dynamics, is acting president of Convair.

Air Chief Marshal **Sir Harry Broadhurst**, who has been commander of Allied Air Forces, Central Europe, becomes managing director of A. V. Roe & Co. Ltd., a member of Britain's Hawker Siddeley Group. He succeeds **J. A. R. Kay**, a director of Hawker Siddeley, who is now in charge of all sales in the aviation group.

**Roy C. Brewer**, formerly with Winchester Corp., subsidiary of Zenith Radio, named sales mgr. of commercial products

for Pesco Products Div., Borg-Warner Corp. **Donald C. Tabb**, retired Navy commander, appointed mgr. of planning and sales administration.

**John C. Forrest** promoted from chief engineer for radar and special products to director of engineering of GPL Div. of General Precision Inc. **Dr. Frank N. Gillette**, former chief engineer for industrial products, named associate director of engineering.

**Roy E. Wendell** promoted from asst. director to director of public relations for Hamilton Standard, succeeding **E. Russell Trotman**, who transfers to United Aircraft.

**Joseph R. Shirley** appointed mgr. of the aviation equipment dept., Radio Corp. of America. He has been an executive asst. in the department.

**Harry C. Archer** promoted by Champion Spark Plug Co. from aviation marketing asst. to aviation sales mgr. **James E. Conner** promoted from aviation sales asst. to asst. aviation sales mgr.

## OTHERS IN AVIATION

**Val Morehouse**, formerly with ICAO in Montreal, named head of the new Far East technical liaison office of International Air Transport Assn. in Bangkok, Thailand.

**Thomas F. McGarry** resigned as aviation promotion supervisor for Port of New York Authority to become public relations director of Air Transport Assn.

**Richard A. Fitzgerald** resigned as National's v.p.-Washington to become asst. general counsel of Air Transport Assn. He succeeds **Paul Reiber**, resigned.

## IN THE AGENCIES

**James E. Dow** named chief of the air traffic control and navigation branch of the systems engineering division of FAA's Bureau of Research and Development. He also continues as asst. chief of the division. Prior to joining the R&D Bureau last January, Dow was chief of the analysis branch of the Bureau of Air Traffic Management.

## OBITUARY

**Max Hymans**, 61, chairman of the board of Air France until last January, died after a brief illness. Hymans had served as head of the French delegation to the Chicago International Civil Aviation Conference in 1944, later was secretary general of French civil and commercial aviation, before joining Air France in 1948. He was president of IATA in 1954-55.



## SNOW

# New Equipment Keeps Runways Clear

By DANNA KUSIANOVICH

Snow removal poses major headaches for airports in the U.S. "snow belt," but the exact relationship between snow-clogged runways and flight schedule disruption is hard to pin down.

Consensus seems to be that snow removal per se does not play a major part in schedule completion, since most airports can manage to have a runway at least partially cleared by the time ceiling/visibility conditions permit operations. However, as all-weather capabilities improve, the effect of snow accumulation will become greater.

A brief *AIRLIFT* study of seven major eastern seaboard airports revealed the following:

Boston's Logan International was the only airport able to furnish exact figures for both airport closure and flight cancellations. Airport Manager James F. Byrne reported that Logan was closed by NOTAM for snow removal for 22½ hours on Dec. 12-13, and for 12½ hours on Jan. 20-21. During these two periods, flight cancellations due to "weather minimums, traffic delays, equipment schedule dislocations and field conditions here and elsewhere" totaled 662 flights.

## 20 hours in February

The Port of New York Authority furnished figures showing that LaGuardia Airport was closed for 20 hours during February for snow removal, and that neither Idlewild nor Newark were closed because of snow accumulation during the December-February period. Idlewild was closed a total of 72 hours, LaGuardia 70 hours, and Newark 71 hours in the three-month period by low minimums.

Washington National Airport, according to former Airport Manager

*PICTURED ABOVE is snow removal equipment used at Montreal Airport to cope with a yearly snowfall of 112 to 120 inches.*

Lou Burton, was not closed during the winter for snow removal, but was NOTAM closed for several hours on some occasions "for a combination of reasons."

Philadelphia International Airport was closed because of snow conditions for five hours on Jan. 20-21, and for 36 hours on Feb. 3-5, according to operations manager Austin B. Brough. No figures on flight cancellations were available.

## Delays under 1%

United Air Lines reported that .83% of its 1140 departure delays in December, .63% of the 1038 delays in January, and .41% of the 941 delays in February were due to "snow and ice removal from runways."

New York's airports have perhaps the largest amount of snow removal equipment in the U.S.—Idlewild has 52 pieces, LaGuardia 16 and Newark 13. These include rotary snow plows, high-speed blade plows, road plows, Sicard rotary brooms and blowers, salt and sand spreaders, tractor plows, bulldozers, road graders and front end loaders. Other equipment is hired as needed.

A study conducted in 1960 for FAA's Bureau of Research and Development by Townsend Engineered Products of Santa Ana, Calif., concluded that snow removal is not the major bad-weather problem in the U.S., but that it will become increasingly important. "Snow removal procedures have not changed materially in the past 20 or 30 years," the report said, and there is great need for in-

formation exchange and for research into the development of "preventive" measures such as runway heating or chemical melting processes.

Most equipment now in use, says the report, was designed for highway use and has neither the speed nor the capacity for airport clearing. "Time is the primary burden," the report adds. "Practically all snow removal equipment currently employed is too slow to permit light accumulations to be cleared during operations of average traffic density . . . as a result, by the time plowing operations can be started, the snow is likely to have accumulated to a depth beyond that which the equipment is capable of handling efficiently . . ."

Last fall, officials at Washington National Airport were preparing for the approaching winter with optimism.

They were looking forward to the scheduled delivery in November of a Walters Co. "Super Snowfighter," a new, twin-engine behemoth reportedly



*ROTARY sweeper with steel-bristled broom clears remaining powdery snow.*

capable of whisking snow from runways at a rate of 15,000 tons per hour.

The winter came, one of the worst in Washington history, and five major storms dumped an official 40.3 inches of snow on the airport.

The day after the last snowstorm, four months behind schedule, the "Super Snowfighter" was delivered.

Even on the basis of limited experience with it, airport officials are enthusiastic about the new piece of equipment. It was used to clean up towering ice banks accumulated from several storms and lived up to its billing, says former Washington National Director L. W. Burton.

The machine, a combination plow and blower, has a top speed of 50 mph and a minimum speed of 1/3 mph. It cuts a nine-foot swath, throws snow 150 feet, has 12 forward and four reverse speeds, individual four-wheel drive, and a reversible blade. It cost FAA about \$40,000.

#### Start at the first flake

"We start with the storm and in consequence generally stay abreast of it," was the manner in which Leigh Capreol, Manager of Montreal Airport, summed up how his working force copes with a monumental snow problem each winter.

Montreal, a highly important North American aviation crossroad, probably has the highest snow precipitation of any airport in the world. It has frequent spells of sub-zero weather from December through March.

With a yearly snowfall of 112 to 120 inches, the snow fighting forces are ever on the alert. Operations are rarely interrupted by snowstorms. When they are, it is seldom for longer than four hours, unless atmospheric conditions are severe.

Montreal often serves as the Idlewild alternate for trans-Atlantic flights. During a snow seizure at New York in

February, it was accommodating some 35 big jets and other large aircraft which had been diverted from overseas. That situation has since been repeated. More than 4000 N.Y. passengers were marooned over the Feb. 4-5 weekend.

Coping with snow has been something like an "old hat" to Montrealers for many centuries. Snow in large quantities is always expected. One of the primary considerations in airport operation is the snow removal equipment.

Montreal Airport employs eight snowblowers, ten snowplows, three scrapers, three loaders, six rotary brooms, and normally six trucks. When snow has to be lifted and dumped elsewhere, additional trucks are hired.

To combat the snow situation, the Department of Transport maintains two-shift crews, 16 men to a shift. Working as a team, they function efficiently. This project is under the direction of J. E. Goulet, assistant airport manager in charge of airport operations.

"The runways are the easiest to handle," states Goulet, "because the snow can be blown clear. We also have to remove snow from the ramp parking areas, which require scraping and lifting, and from the hangar areas and the many service roads throughout the airport.

#### High speed operation

"We have one runway 9600 ft. long and two of 7000 ft., all being 200 feet wide, with 100-ft. wide taxiways," he added. "These we handle with the combination of a snowblower followed by a Sicard rotary broom sweeper. On the runways we can operate at high speeds and remove the snow right down to the concrete, the sweeper preventing ice or packed snow on the runways."

The addition of the rotary broom

sweepers to the Montreal snow-fighting equipment has proven highly successful. They are towed by a truck and operate at 25 to 35 miles per hour. The broom is three ft. in diameter and 14 ft. long. It is made of durable steel bristles in tufts, and is driven by an auxiliary gasoline engine which rotates the sweeper at 450 rpm.

The tricycle vehicle, which weighs approximately five tons, is equipped with a compressed air blower, extending from the rear of the vehicle. It has a production of 1200 cu. ft. per minute, which blows aside and clears any flying snow stirred up by the revolving sweeper. The blower, like the sweeper, is operated by the auxiliary eight-cylinder engine.

A virtue of the towed runway sweeper is versatility. It can be used in other seasons of the year, particularly for sweeping and blowing gravel, sand and other substances from runways.

#### Coordinate with weather bureau

Montreal officials closely coordinate their efforts with the weather bureau and traffic control. When they know snow is coming they are geared for action and get down to the job from the beginning of snowfall.

The requirement for 100% clearance of taxiways is not of immediate concern, nor is the total clearance of the ramps, service and hangar areas. These are tackled as soon as possible but the main idea is to keep the runways open and aircraft mobile while taxiing to and from their starting gates.

The rotary sweeper is also useful for following conventional snowplows, for it picks up and sweeps aside the residue, which otherwise would be compacted to icy snow or ice by aircraft and truck wheels. In this way a "black top" surface is generally maintained at Montreal. ■



TEAM OF B. L. SNOWMASTERS is used at Montreal Airport. Following each other down the runway, Snowmasters bite deep into snowbanks, throwing arching spouts of powdery fluff off to the side. Operations begin soon after flakes begin to fall.



## NEWS IN BRIEF

### EQUIPMENT

**New orders**—Lufthansa has confirmed it will order 12 90-passenger Boeing 727s at about \$50 million, bringing Boeing's total for the medium jet to 92. Delivery will be six in mid-1964, six in mid-1965.

Northwest Airlines placed its first jet order with Boeing for six turbofan 720Bs to be delivered starting in June 1961. Contract amounts to \$36.7 million including spares and contains option for an additional six.

British Aircraft Corp. has sold three Viscount 810s to All Nippon for delivery this summer. Lufthansa has bought one more, bringing its total to 10 and the overall Viscount sales count to 429.

**New performance**—Douglas reports its JT3D fan-powered DC-8 will have a 23% range improvement over present long-range DC-8s and 30% if fitted with extended wing leading edges.

Braathens SAFE has ordered one and All Nippon three Fokker F-27s. Fokker now has sold 91 and Fairchild 82... FAA has taken delivery of its Lockheed Electra to be used in proficiency training of pilots and inspectors.

**Resales**—REAL (Brazil) has received three DC-6s purchased from SAS.

It also is buying five Lockheed Electras from American Airlines, reducing AA's Electra fleet to 28.

### FINANCE

**Jet prices up**—Starting May 1, Boeing prices on jet transports increase from 4.7% to 7.5% (\$225,000 to \$315,000). Increase affects Model 720 with JT3C7s, the 720 with JT3C12s, the 720B and 707-120B.

**The Prudential 720**—Eastern Air Lines and Prudential Insurance Co. have asked CAB to OK deal whereby EAL will lease 10 Boeing 720s and 20 spare P&W JT3C-12 jets for 10 years. Annual rent will be \$641,912 payable at \$320,956 semi-annually.

**Subsidy for Hawaiian**—Hawaiian Airlines followed the path of its competitor, Aloha, with a bid to CAB for \$461,700 in annual temporary subsidy. Among HAL's reasons: business recession, a threatened sugar strike and the introduction of F-27s by Aloha.

**Bonanza profit**—Bonanza Air Lines completed 1960 with a net profit of \$220,000 based on preliminary figures. Revenue was up \$786,000 as total operating costs were cut from 5.15¢ in 1959 to 4.66¢ per seat-mile in '60.

Lake Central Airlines has declared the first quarterly dividend of 14.44¢ on its new 6½% preferred stock.

### AIRPORTS

**MacDill Pickle**—A political hassle has erupted in the St. Petersburg-Tampa area following a stop order by FAA on funds slated for improvement of Tampa International Airport. FAA wants to take another look at MacDill AFB which becomes surplus to the Air Force in mid-'62.

Close observers view the FAA step as a bit late—some \$6.8 million has been spent at Tampa and future plans call for

another \$14.2 million. Renovating MacDill would cost \$14.4 million plus another \$10- to \$13 million for a superhighway to feed it.

**Ozark at O'Hare**—Ozark Airlines is planning a \$750,000 hangar at Chicago's O'Hare Int'l Airport that will house three F-27s. Target for completion is late fall.

**Airports awards**—Idlewild Airport has been named by the American Society of Civil Engineers as the outstanding civil engineering achievement of the year. The St. Lawrence Seaway project won the award last year.

**New job**—Miami International Airport, which employs more than 30,000 people, is big enough to engage a full-time sanitarian. What is that?... An official responsible for the health, comfort and safety of passengers, crew members and airport personnel.

### ADVERTISING

**New policy at Eastern**—A major shift in advertising policy at Eastern Air Lines is underway. A new institutional campaign will stress EAL's passenger service, an area in which the carrier has shown major advances over the past year.

**Post mortem**—CAB has ordered Eastern Air Lines to stop using the model "DC-8B" in ads, despite the fact that its own staff used the same designation (but with a lower case "b") to describe the aircraft EAL operates.

**New faster twist**—Airlines have found the answer to ban on advertising the "fastest" schedule if there's a standoff. The new messages read "there is no faster service to..."

### NEW BUSINESS

**New venture**—Century Universal Corp. has been formed in Tulsa, Okla. to produce the Euphorian aircraft seat under license from Universal Equipment Corp.,

Beverly Hills, Calif. Company expects a \$50,000 to \$100,000 a month production volume in its first year.

**Nav counters**—Ford Instrument Div. of Sperry Rand has ordered angle counters (which provide readout on airborne navigation equipment) from the Bowmar Instrument Corp., Fort Wayne, Ind. The \$23,000 contract represents a reorder. Counters will be used in Sperry's ASN-7 nav system.

**Power packs**—A contract for the manufacture of power packs and thrust reversers for Boeing 727 aircraft has been awarded to the Rohr Aircraft Corp., Chula Vista, Calif. Rohr will build the units at Chula Vista and at Auburn, Wash. First units will be delivered in mid-'62.

**727 gear**—Another Boeing contract, for 727 nose landing gear, has been given to the Menasco Manufacturing Co., Burbank, Calif. Menasco now supplies nose gear for 707s and KC-135s and main gear for the 720.

**Reservations**—Eastern Air Lines has ordered two Remington Rand Univac 490 Real-Time Computers which will be used to furnish 876 Eastern reservations agents in 17 metropolitan areas with seat availability and other flight information.

**Dart overhauls**—A new back up plan for Dart engine users has been announced by Airwork Corp. which eliminates the need for advance payments to insure emergency service. New Dart engines will be stored at Millville for immediate delivery to Gulfstream and Friendship owners.

Dallas Airmotive, Inc. has announced completion of a Dart Overhaul shop. Part of the Dallas Airmotive service is a rental plan for use during engine change which guarantees a replacement engine within 48 hours. The engine is shipped as a complete Quick Engine Change with mount, accessories, and auxiliary items to permit a four-hour change.

**Bid for business**—American Airlines has received its FAA Repair Station certificate and is opening the doors of its Tulsa overhaul base to outside business. It is interested in contract jobs for mili-



**A BIG WINNER FOR LOCKHEED**—Artist's sketch of the future C-141 "optimum" cargo jet transport which won for Lockheed's Georgia Division a potential billion dollar Air Force contract. It will gross 260,000 lbs. and carry 60,000 lb. payload over 3400 mi. range. Powerplants will be P&W JT3D-8A. It previously was designated SOR-182, SS476L and CX-1 aircraft. (See page 17 for more details.)

tary, executive aircraft and airline customers. FAA rating covers nine types of jet and piston aircraft, their propellers, instruments and accessories, including radio.

**Ground support**—Tenney Engineering, Inc., Union, N.J., has announced formation of a division to design, develop and produce ground support devices for pre-flight checkout of aircraft. A Tenney subsidiary, Communication Measurements Laboratory, produces electronic generators, power supplies and test equipment.

A new ground support division has also been established by General Electric. It is established within GE's Aviation and Defense Equipment Sales Operation. Heading the team will be Charles J. White, in Washington, D.C., and ground power application engineering manager James W. Scanlan at Waynesboro, Va.

## ELECTRONICS

**Electronics bid**—The Martin Company is eyeing air traffic control as a potential outlet for electronics expansion. Eager to conquer new, non-military fields, Martin engineers seek to pit Missile Master air defense knowhow against the still uncertain FAA concept for airways control. Exotic communications systems, as yet largely undeveloped, will figure prominently in proposals Martin hopes to present when the field is firmer.

**Fairchild acquisition**—Waste King Corp., Los Angeles, announced plans to sell its flight data recorder and Color King printing press business to Fairchild Camera and Instrument Corp., Syosset, N.Y.

**Service**—A nation-wide electronic service division has been established by Federal Electric Corp. of Paramus, N.J., to provide complete range of technical installation and maintenance services in fields of communication, data processing, instrumentation and automation.

**Collins autopilot**—The British Air Registration Board has approved the Collins AP-103 automatic pilot for use on Trans-Canada's Vickers Vikings. The TCA aircraft also have Collins FD-105 flight director systems, DF-202 automatic direction finding systems, 51X-2 VHF receivers, 17L VHF transmitter and 344B-1 VORS.

**Pye ILS**—The airfield at Bahrain in the Persian Gulf has been outfitted with a Pye instrument landing system. This brings to more than 100 the number of Pye instrument systems installed throughout the world.

**Marconi orders**—The British Ministry of Aviation has picked the Marconi Doppler Navigator (Type AD2300B) and Automatic Direction Finder (Type AD712) for use in Argosy C. Mark 1 aircraft flown by the RAF Transport Command.

**Weather radar**—Wilcox Electric Co. has signed a contract to produce weather radar equipment under a licensing agreement with EKKO Electronics, Ltd., England. The agreement gives Wilcox manufacturing and distributing rights for a world market, exclusive of the U.K.

**Dealerships**—Mohawk Airlines has been appointed factory distributor for Collins Radio Co. and factory dealer for Aircraft Radio Corp. Mohawk will stock Collins and ARC equipment for sale to customers and may establish dealerships within the U.S.

**Three-D radar**—Westinghouse Electric Corp. disclosed development of "three-D" radar in which altitude information is combined with direction and distance to pinpoint targets. Development was made in connection with the Air Force, and no



**AFT OF THE CARGO—PASSENGERS.** This interior arrangement, being proposed to the Civil Aeronautics Board by Seaboard & Western Airlines as an experiment in low-cost transatlantic passenger service, would employ pallet-loaded seats in a Canadair CL-44 turboprop cargo plane. Sparkplug for the new concept is S&W's energetic new president R. M. Jackson (shown above).

plans for civil implementation were announced.

**AIDE**—Lear, Inc. has FAA contract to design and build Airborne Insertion-Display Equipment, the cockpit portion of FAA's automatic Ground-Air Communication System. The instrument will be capable of displaying 64 separate words and phrases, color coded to differentiate between incoming and outgoing communications.

**Sperry-Europe**—Sperry Gyroscope Co. has announced formation of the Sperry Europe Continental Co. to handle sales and service of Sperry aviation and other equipment in Western Europe. Headquarters will be in Paris. New company's prime concern will be aeronautical products.

**Transport orders**—Elliott-Automation Ltd. has disclosed an order for lightweight "21 series" VOR/ILS navigation and VHF communications equipment to be used in RAF Transport Command's Argosies, Belfasts and Comet 4s. Elliott Brothers manufactures the "21 series" under license from Bendix Corp. of America.

## MISCELLANY

**Bradshaw's end**—After 122 consecutive years of publication, Britain's *Bradshaw's Monthly Railway Guide* (including *Bradshaw's Air Guide*) will cease publication in May.

**Name change**—California Eastern Aviation, founded by a group of United pilots back in 1947, is changing its name to Dynatronics Corp.

**Vertol census**—A recent Boeing headcount of Vertol-built helicopters used outside the U.S. came up with a total of 192. France leads with 127, Germany has 32, Canada 23, Sweden 8 and Japan 2. There are 850 in the U.S.

**Cold facts**—SAS recently marked its 1000th scheduled flight over the North Pole since start of that service to the

Far East in February 1957. Until SAS came along, the North Pole had been crossed only six times in the previous 21 years.

**New cargo**—Three recent shipments of polio vaccine carried by Japan Air Lines from U.S. pharmaceutical houses totalled 12 tons, enough to inoculate 300,000 persons.

**New look at NOR**—North Central Airlines is updating its corporate image under the guidance of industrial design consultant Karl Brocken. New aircraft markings will use blue, turquoise and white as basic colors with red and gold accents. Cabin interiors also are being refurbished.

**Weather data**—FAA flight service specialists will be trained to handle preflight briefings and answer air-ground requests for weather information. Weather briefings will be conducted from 330 FAA flight service stations and 80 combined station towers. Program will triple number of U.S. offices dispensing preflight weather data.

**Sports airlift**—Sports fans attending the March 13 heavyweight championship fight at Miami Beach arrived via 20 chartered Northeast Airlines 880s. Some 2000 fans were transported by Northeast between major east coast cities and Florida. The entire operation was done on credit, with Diners' Club handling the billing.

**Pacific nonstops**—Riddle Airlines is flying Tokyo-California nonstops as a regular diet with DC-7Fs returning from one-way MATS charters. It flew Tokyo-Chicago (6307 mi.) and is now shooting for Tokyo-Washington, D.C. to prove the outstanding interim airlift capability of convertible passenger/cargo DC-7Cs.

**Argosy fix**—A team of Armstrong-Whitworth engineers are at Riddle Airlines' Macon, Ga. Lagair training base to develop a fix for tail skin cracks which showed up after 185 hrs. flying time. Areas involved are the tail boom, vertical stabilizer, elevator trailing edge and wing flap.



# Carriers Face New Safety Rulemaking

Carriers face a two-pronged FAA rule-making in aircraft maintenance that reflects the seemingly inevitable airline-government regulatory conflict: Carrier need for operational flexibility vs. government's drive for uniform standards to insure safety.

FAA wants to (1) set uniform standards for Daily Mechanical Reports (DMRs), shifting to government the airlines' existing responsibility for determining what incidents involve "serious hazard" to safe operation, and (2) create new Maintenance Standard Orders (MSOs) to improve uniformity in the manner in which operators meet existing general maintenance requirements of the Civil Air Regulations.

The DMR rulemaking would cover more than a dozen specific inflight and on-the-ground failures, malfunctions or defects, and any added incidents the carrier believed "has seriously endangered or may seriously endanger" safe operations. FAA also would specify the form of report. Carriers, in comment due no later than April 20, are expected to key their response to whether they believe the proposed DMR procedure would produce so many reports as to make the system self-defeating.

In its MSO plan, FAA says its proposed new Part 515 of the administrator's rules would "gradually" replace with MSOs existing maintenance policies now carried in CAM 18 and in various circular letters and directives. The agency took the unusual step of tacking to the draft release a specific MSO proposal covering high-speed aircraft tires. It wants comments on its suggestions no later than April 19, and rebuttal comment by May 21.

## VIOLATIONS

• **TWA and Pan American** have paid FAA a total of \$6500 in civil penalties for three maintenance incidents and a fatal ramp accident.

• **The agency reduced** an initial \$6500 fine to \$4500 but cited TWA's "serious disregard" for maintenance-inspection standards for permitting "numerous" flights of a Constellation 1049-G in December, 1959, with an inoperative fuel gauge and tachometer. It charged that the fuel indicator had been logged a total of 53 times and the tachometer 11 times, and the plane had been illegally dispatched 17 times with the bad fuel gauge and four times with the faulty tachometer. FAA denied TWA's claim that these dispatches did not violate the CARs.

• **TWA also paid** \$1000 for what FAA termed its "principal responsibility" for improper chocking of a Connie that rolled forward into a truck, its No. 1 prop slicing through the cab and fatally injuring a flight engineer. The accident took place at Idlewild June 8, 1959. FAA said there was a mechanic at the flight engineer's flight station, but no one in the pilot's

In other rulemaking:

• **Another regulatory move continues** FAA's direct reaction to the Dec. 16 New York mid-air collision (AIRLIFT, March): Pilots now must report "immediately" to ATC any "inflight malfunction" of navigation or communication equipment. FAA has insisted it could have given safe special handling to the United DC-8 involved in the New York collision if ATC had known one omni was partially or completely out of commission.

• **Similar response** to a recent accident is obvious in FAA's new instruction to tower controllers to refuse clearance for any civil passenger or cargo carrier flight when visibility is below a quarter of a mile, or Runway Visual Range (RVR) less than 2000 ft. It marked the first extension of clearance authority beyond the bounds of traffic, and clearly stemmed from the Arctic-Pacific charter-football accident in near zero-zero takeoff conditions last October. Not-for-hire aircraft may be exempted by special pilot "appeal."

• **Long-planned establishment** of an intermediate altitude airway system was launched with final rulemaking lowering the floor of the continental control area from 24,000 to 14,500 ft. The change brings down to the 14,000-24,000 ft. altitude layer the previous high-altitude VFR minimums of five miles visibility and cloud distances of one mile horizontally and 1000 ft. vertically. The agency granted general aviation its requested use of the Flight Level 140, and air carriers their request for simultaneous revision of standard altimeter setting procedures to conform to the new control area floor.

seat, as the engines were run up for generator balancing.

• **Pan Am was fined** \$1000 for two maintenance incidents last fall in which FAA inspectors found outflow valve swirl vanes detached from supporting structures on PAA 707s. FAA said it took into consideration the airline's "new procedures" to prevent recurrences.

• **Actions against pilots** included revocation of the ATRs of two pilots accused of taking 48 passengers through "known or probable" heavy icing that forced their C-46 down from 7000 to 2500 ft. on a Louisville-to-McQuire AFB flight Feb. 13, 1960. They are Capt. Fred Scott of Miami, pilot-in-command of the Associated Air Transport aircraft, and Capt. Robert J. Jones of Hialeah, Fla., left-hand-seat pilot who actually flew the trip. A first officer was not charged. FAA charged the two pilots with "deliberately" passing several suitable fields while icing built up. Both revocations were effective March 10.

• **Other enforcement actions:** A six month ATR suspension, most of it retroactively, on **Regina Cargo Airlines Capt. Vincent J. Faix**, Miami, for a number of violations FAA said he committed in a Newark-San Antonio military passen-

ger charter flight Jan. 3, 1960, marked by a balky C-46 engine . . . An "emergency" suspension pending successful re-testing of **Capitol Airways Capt. Leo L. Wassenberg**, San Bernardino, who flunked a Jan. 27 oral exam and flight check . . . A 30-day retroactive suspension of the ATR of **Capt. Thomas P. Gleason** of El Paso, pilot-in-command of a **Continental Air Lines** flight who extensively damaged the American Airlines-owned DC-7 by raising the gear instead of the flaps on a landing roll at Dallas June 23, 1960 . . . A \$500 compromise fine on **Blatz Airlines**, Los Angeles, for a series of 30 pilot flight time violations; FAA noted as well as the number and "seriousness" of the violations the carrier's past good record and the fact many of the flights involved emergency work for the U.S. Forest Service . . . A \$200 fine against **TWA** for an improper weight-and-balance calculation on a cargo Constellation which settled on its tail on a ramp in Paris . . . A \$100 penalty against **Braniff** maintenance man **John M. Dandois**, Dallas, for a retainer bolt falling off a Convair 340 nose wheel after he had replaced the tire last August 13 . . . A \$125 fine for **Continental** maintenance man **C. A. Echenique**, Miami, for an improperly replaced DC-7B engine accessory cowling last September 6 . . . \$100 on **Pan Am** inspector **W. D. Dimitrovich**, Mystic Beach, Long Island, for failing to catch five missing rivets, a one-quarter-inch skin crack and a failed stringer on a 707 which he had "divided" with another inspector.

## Safety Rulemaking

FAA is well-launched in a long-range safety regulation recodification which it hopes in something less than two years will produce a "single, simplified body of regulations" from today's CARs, CAMs, administrator's rules, airworthiness regulations and air carrier operating specifications and certificate limitations.

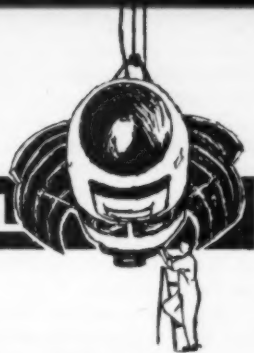
James Minor, one of a group which recodified the Pentagon's military statutes, is working under Associate General Counsel Gerald F. White. Current basic project for the whole job is building a "structural outline" within which all the varied existing regulations can be pieced together.

## Retirement

FAA at this writing may already have won the last battle in the FAA-ALPA war over pilot-retirement-at-60: The U.S. Circuit Court of Appeals in New York upheld a lower court's action that had, in effect, dismissed the pilot's suit.

The appellate court's decision left ALPA with no further recourse save a petition for certiorari (review) by the U.S. Supreme Court. And though ALPA President Clarence N. Sayen already has pledged such a finish fight, the New York court's ruling was unanimous, dimming chances such a petition would be granted. Pilots have until May 10 to decide.

# MAINTENANCE / OVERHAUL



## Structural Steel and Grip Flooring Featured in TWA-Built Work Docks

TWA designed and built its own work docks for overhauling jet aircraft at Kansas City, at a considerable saving in time and cost and a big boost in efficiency.

The docks were designed by W. J. Watts, senior engineer. The 26-piece, \$115,000 design provides access to all parts of an aircraft. It is so versatile that it can be used on any of the three types of jets serviced at the base.

Use of structural steel and welded grip-strut flooring provides strength at minimum weight and at a minimum of maintenance.

Construction on the two-piece tail tower was begun on Dec. 2, 1959 and was completed about four months later. The tower is 36 ft. 10 in. tall and has four work levels. The plant maintenance department did the actual construction.

TWA had used expanded metal net flooring on its earlier elevated work

scaffolds, but Watts found that heavier, grip-strut material was more practical and provided a firmer base for workmen.

At key points on the docks are compressed air outlets for paint sprayers. Intercom systems are provided so that foremen can direct the overhaul operations from their floor positions. Water outlets, electrical power sockets and vacuum cleaning outlets also are provided.

"Practically everything needed for the overhaul is built right into the docks," Watts said. "You can walk around the entire airplane without going onto the hangar floor."

The 12½-ton tail tower originally was designed for an air motor which would power the tower to and from the aircraft. But each half moves so freely on its eight casters that several workmen can pull it with ease, so the motor wasn't installed. Each half moves

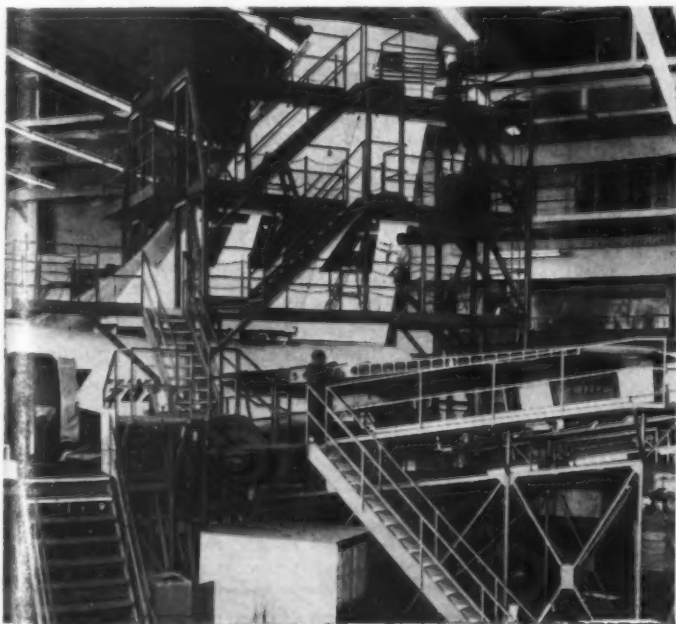
along a track imbedded in the concrete floor, the track serving as a guide for proper placement of the tower.

To extend sub-surface air, water and electrical services to the docks, TWA cut trenches into the concrete floor, then made extensions off of the main trench that carries pipe and wiring the length of the hangar.

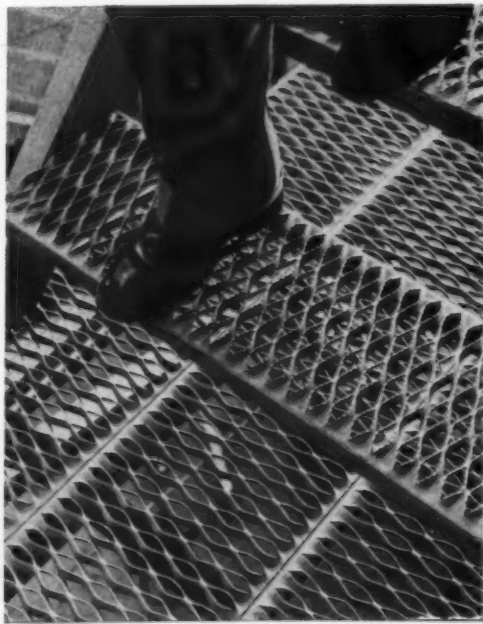
"Because of the ease and speed with which these docks can be put around or taken away from an airplane, plus their adaptability to three types of planes, we think this is the best facility of its type anywhere," said A. P. Kasprovich, manager of tool and equipment design at the base. "The cost of engineering and building it here was considerably less than the expense of having it designed and fabricated by an outside firm."

## Portable Line Checkers Pinpoint DC-8 Maladies

Maintenance time has been reduced on 14 DC-8 inspection areas by special line system checking equipment de-



WORK DOCKS designed and built by TWA are shown in use by mechanics engaged in 707 maintenance. Docks can also be used with DC-8s.



GRIP-STRUT flooring is used in the docks to prevent slipping. Grease and oil leak through to floor.

veloped by Douglas and available to DC-8 operators.

The line checkers are 10 x 6 x 4 inches in size and are designed to be carried right to the system to be checked. Each checker is powered from the airplane. The unit is plugged directly into the system and the check can be made without modification of the airplane wiring.

The equipment includes checkers for fuel flow system, oil quality system, oil cooler control system, engine pressure ratio, power phase sequence, cabin temperature control, engine fire detector system, windshield heater system, wing slot deicing system, and cabin pressurization system.

There is also a refrigeration control system analyzer, turbocompressor RPM indicator analyzer, turbine monitor (for overhaul facility use only), and portable refrigeration control system analyzer.

The engine fire detector system line checker can be installed between any one of the engine fire detector amplifiers and its associated wiring. The resistance check of the sensing circuit tends to minimize false fire alarms. The resistance of the sensing element (a function of temperature) is indicated on the checker ohmmeter.

Measurements may be observed while the engine is cold, during starts or at any power setting during ground run-up under actual engine heat and vibration. The check may also be made during flight, if desired.

Any reading below a minimum established resistance will require a sensing circuit investigation to prevent possible false alarms in flight. Should a dangerously low resistance or a high rate of resistance change be observed, the checker circuitry is immediately bypassed by releasing the spring-loaded SENSING CKT switch, thus enabling the normal fire warning system to respond immediately to a fire signal.

The line checker's use may result in detecting, while on the ground, failure which normally would be detected later in flight. If a high rate of decrease is noted on the line checker during engine operation, it probably indicates a hot air leak in the nacelle or insufficient spacing between the fire detector element and engine or structure, or an intermittent short.

The checker incorporates its own meter checking circuit to insure proper operation of the checker meter on both the high and the low resistance measurement ranges. It also has an amplifier calibration switch.

## AA Trimming Engines By Remote Control

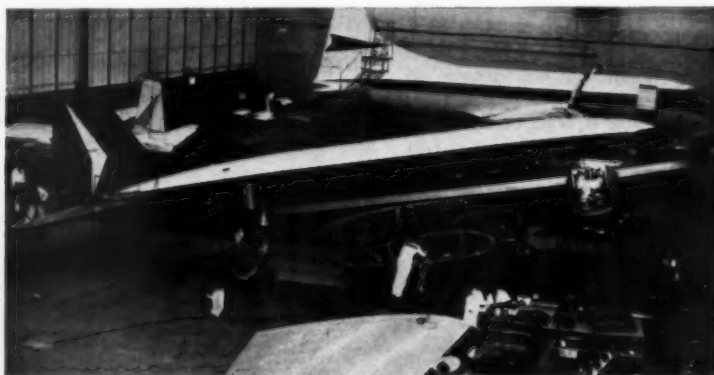
American Airlines is trimming two to six jet engines a day by remote control at its Los Angeles maintenance base with a "remote trimmer" developed by Lear, Inc.

Trimming is required when a new engine is installed and when, through ordinary operations, it becomes necessary for an adjustment in the fuel flow to be made.

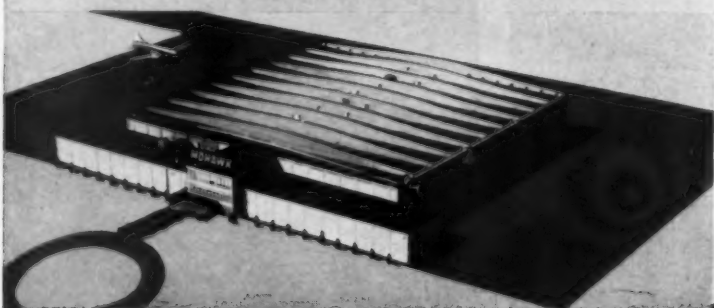
Under the old method, trimming was a manual operation requiring more than an hour per engine. The fuel flow to the engine was manually adjusted by a mechanic located near the engine and exposed to extremes of noise and heat. He had to coordinate his adjustments with the maintenance specialist in the cockpit, via telephone.

The Lear remote trimmer has been used by American for more than a year. It permits the ground crew to trim from the cockpit through a cable connected to the engine and complete the trim procedure in less than 15 minutes.

This system is more accurate than the manual method because of the more precise adjustment of fuel flow.



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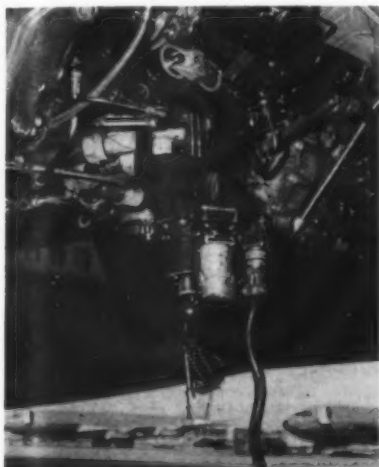
June 2-3, Reading, Pa.

It also reduces safety hazards and noise.

The remote trimmer features the following: remote control capability, portability, simplicity of operation and high adaptability.

The system is adaptable to all jet aircraft. Installation may be made with a minimum of motion, requiring only removal of the airframe access panel and a single "clamp-on." Ground crews are not exposed to possible psychological hazards. Communication difficulties are eliminated.

The complete system weighs less than one-half of the military specification



AA's remote engine trimmer.

allowable for portable equipment. The control box allows pre-selection of adjustment and single-switch trimming. Compactness of components keeps storage space at a minimum. Torque limiting is "built in", and is accurate and "chatter free." The fast speed-versus-torque performance has reduced "hunting" during adjustment.

No revisions are necessary to utilize the device on most fuel controls. Complex fuel controls require only a simple retrofit of one or two noncritical components.

## PAA Uses Microfilm For Maintenance Data

Pan American World Airways has found microfilm used in conjunction with Thermo-Fax "Filmac 200" readers-printers a saving in both time and money in the maintenance of 707 and DC-8 aircraft.

Thousands of engineering drawings are used in transport airframe manufacture and copies must be available to personnel at Pan American's two principal maintenance depots, Miami and New York.

Drawings are used regularly in the

standards engineering department. Production control needs drawings for identification in maintaining a running inventory of component spare parts. Engine overhaul shops require drawings in buildup of power packages. Component overhaul shops use drawings to determine dimensions and tolerances of the various parts.

Prior to microfilm, Pan American used blueprints of the original engineering drawings for maintenance and engineering, but there were many drawbacks to such a system.

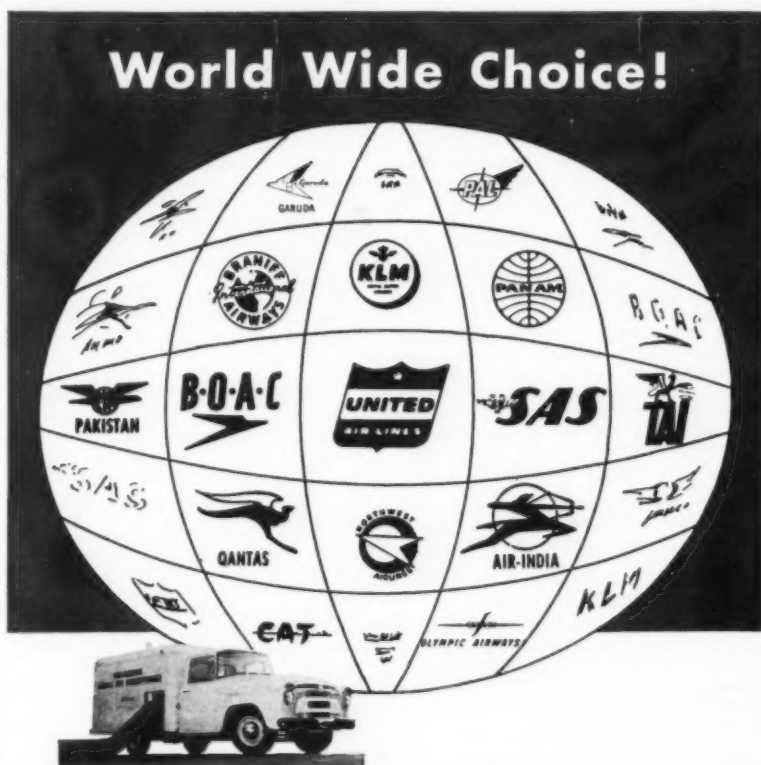
Blueprints are cumbersome to handle. Frequently they are 22 x 28 in. or larger. They take considerable space to store, and tend to curl and wrinkle.

Because they are filed flat, one atop the other, they are slow in retrieval.

Duplication is difficult. It can take up to 72 hours to obtain a blueprint copy. Blueprints also tend to fade after a period of time.

When jets were introduced, both Boeing and Douglas supplied Pan American with microfilms of all of the engineering drawings used in the construction of their aircraft. Boeing supplied microfilm mounted in Filmsort aperture cards. Douglas supplied another system, the "CIM" card. Both are usable in the "Filmac" 200.

The current microfilm file from Douglas totals more than 50,000 drawings and the Boeing file more than



## Hokanson H-35 Mobile Air Conditioner

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25,000 just in New York. Miami has 30,000 more Douglas drawings.

Manufacturers supply complete sets of microfilmed engineering drawings and specifications—one for manufacture and the other for servicing. The drawings are keyed by number to master section documents and, in most cases, to maintenance manuals, overhaul manuals and service bulletins.

Maintenance personnel need only to refer to the number of the document, select the proper microfilm and, through the use of the "Filmac 200" reader-printer, have an enlarged image of the drawing on the projection screen. Should a copy be needed, an enlarged 18" by 24" paper copy of the drawing can be produced within ten seconds.

## NEW PRODUCTS

### Vacuum Sweeper

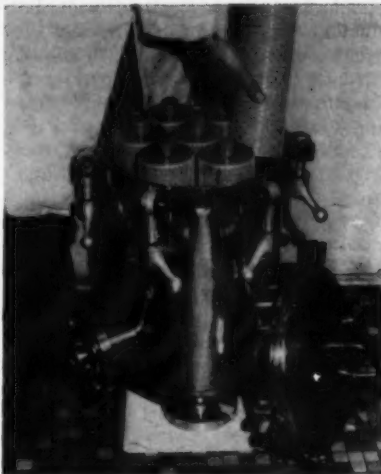
Equipment for cleaning aircraft runways and ramps by air pressure is being built by the International Fermont Machinery Co., Ramapo, N.Y. The equipment can clean up to a million square feet of runway per hour.

The equipment can accommodate particles the size of a baseball, bars and bolts an inch thick and three inches long, mechanics' small tools, dead birds and wildlife.

Each unit weighs nearly nine tons, measures eight feet wide, 30½ ft. long and stands 11 ft., 10 in. high to the top of the operator's cab. Power is provided by two eight-cylinder gasoline engines. One, at 193 horsepower, propels the vehicle at speeds from three to 25 miles per hour while sweeping, and up to 35 mph on the highway. The other engine, 256 hp, drives the fan at 2800 rpm. The vehicle is equipped with headlights and a revolving red light on the top of the cab.

### Hydraulic Filter

Hydraulic and other petroleum-based fluids and water can be filtered to absolute 3-micron cleanliness by a Triphane filter assembly at rates up to 170 GPM continuous flow. No recirculation or preliminary filtration is required.



Triphane filters.

The filtering equipment was developed originally for processing bulk MIL-H-5606 hydraulic oil before packaging. It features high dirt capacity. The heart of the unit is a combination fiberglass membrane primary throwaway cartridge. The primary cartridges are followed by a third stage Rigimesh corrugated sintered woven wire mesh filter element which provides 98% 5-micron filtration and absolute 18-micron filtering.

The unit is a development of Aircraft Porous Media, Inc., a subsidiary of the Pall Corp., Glen Cove, N.Y.

### Maintenance Platform

Here's a new use for a standard item: the Standard Manufacturing Co. of Dallas has converted its MJ-1 bomb or missile lift into a mobile maintenance platform. The unit is adaptable to many airline maintenance operations.

Construction is simple. The unit can be broken down in shipment in order to conserve space. The platform frame is aluminum pipe but is not threaded or welded. Nu-Rail fittings, which are fastened to the pipe by tightening recessed set screws, permit one individual to assemble the platform in a few minutes.

In addition to hydraulically-controlled height adjustment, the platform can be adjusted along vertical supports by a pin-

and-hole arrangement. It may be removed from lift by four clamps, to be rolled on its own casters.

### Food Shelving

Erecta-Shelf, a product of Metropolitan Wire Goods Corp., Wilkes-Barre, Pa., is used by Swissair to provide inexpensive handling of inflight foods. Erecta-Shelf is steel rod shelving equipped with rubber casters. It can be assembled quickly, without nuts, bolts or special tools.

The shelving is lightweight but sturdy, and can support up to 1000 lbs. per shelf. Shelves are adjustable every five inches to accommodate any shape or size of container.

Erecta-Shelf is available with heavy plating or in stainless steel. It is approved by the National Sanitation Foundation.

### Closed-Circuit TV

General Electric Co. has engineered a new series of closed-circuit television monitors specially designed for commercial transportation surveillance.

A significant feature of the new monitors is increased definition. At 800 lines minimum horizontal resolution the monitors exceed the capabilities of all presently-available camera chains. They are particularly suited to operation with General Electric's TE-9A camera, a compact, self-contained model that is designed to function efficiently under severe environmental conditions.

The monitors are also designed to be adaptable to closed-circuit display uses in airport terminals, where a variety of small figures could be reproduced with readable detail. Special circuits help cancel electrical interference caused by high-power equipment, and ready access to the internal circuits aids maintenance.

### Electronic 'Blackboard'

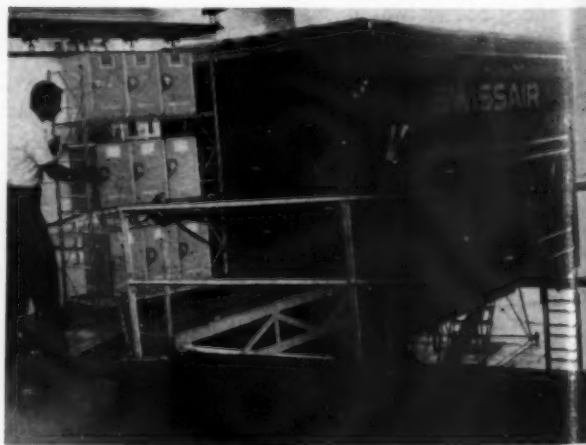
Radar control of the airways is expected to be simplified by an "electronic blackboard" developed by the Hughes Aircraft Co. which presents radar information, stores it and erases portions to make way for new information.

The heart of the system is a new vacuum tube which resembles a standard radar or television display tube externally. But inside, special screens and "writing guns" provide a totally new kind of radar display.

Like a blackboard, the new Hughes tube can retain radar information for varying



Fermont Machinery Co. runway sweeper.



Erecta-Shelf unit for food service.



Telex headset.

periods of time for detailed examination. Or, it can erase all or part of the data being displayed to permit new material to appear. Furthermore, one set of information can be written on the face of the tube and stored, while other changing or moving information is superimposed over the "permanent" display.

Presently being produced for military applications, the new tube is available for use in civil air traffic control systems whenever its particular advantages are required.

### Headset

Higher impedance and greater sensitivity have been achieved in a new headset developed by Telex, Inc., a St. Paul electronics firm. The Mark III Magna-Twin, first introduced at the international IRE convention in New York last month, has a 50 to 9000 cps response making it especially suited to speech transmission.

Maximum impedance is 200,000 ohms—believed to be the highest of any headset on the market. Sensitivity in the Mark III has been increased to 120 db at 1000 cps at 1 mv input.

A magnetic driver, unaffected by shock or temperature and humidity changes, contributes to the unit's ruggedness. Of one-piece construction, the headset is designed to resist tampering. It can be sterilized for multiple use requirements. Newly-designed, foam-rubber muffs provide comfort and reduce ambient noise. Weight is 12 oz.

### Dynamic Microphone

A noise-cancelling, moving-iron diaphragm, dynamic microphone has been designed by Amplivox, Ltd. and is offered as a replacement for carbon mikes in airborne communications.

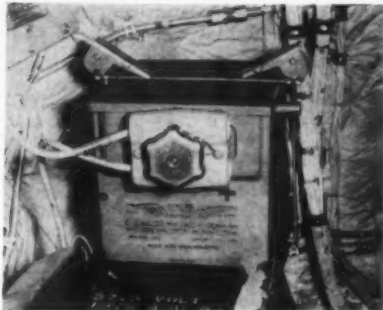
The dynamic configuration is advanced by Amplivox as a substitute for the poor speech quality and high noise characteristics of carbon microphones, qualities which often vary significantly with age.

Amplivox provides tiny transistor amplifiers which can be used to boost the output of dynamic mikes to exceed that of carbon units. The amplifiers are built into the plug-socket assembly or are supplied for direct attachment to the headband of airscrew headsets.

### Aviation Battery

A sintered-plate, nickel-cadmium battery is standard equipment on Convair 880 aircraft and on a number of other U.S.-built jets. The Sonotone battery, Type CA-121, is used for engine starting.

Providing 27.5 volts at 13.5 ampere hours, the battery is installed in the electronics compartment below the flight deck. Pressurized, the 880 compartment can be reached from the flight deck while the aircraft is in the air.



Sonotone battery.

### 'Ticketeer'

Delta Air Lines has installed "Ticketeer" devices at Atlanta to speed ticket preparation. Designed and built by the Burroughs Corp., the devices permit a ticket agent to list a customer's origination and destination cities, fare, transportation tax, class of service and auditing data in one operation.



Burroughs Corp. "Ticketeer."

The secret is the use of a pre-selected matrix which is inserted into a desk-top machine. Ticket preparation time is reduced up to 50%.

Delta has plans to place the machines in many of its 67 cities. The first units were installed in the Piedmont Hotel and Fulton National Bank ticket offices in downtown Atlanta.

### Miscellaneous Briefs

Photosensitive glass that can be precision patterned by chemical machining is being used for aircraft dials. Corning Glass Works now makes dial blanks of

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8. Optimum engine failure climb
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12. Exact descents OMNI approaches

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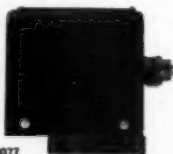
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- Oil-free air discharge
- Delivers 1 CFM air at 45 p.s.i.g.
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**Calco** MANUFACTURING COMPANY  
ADDISON, ILLINOIS

Fotoform B glass, delivers them to aircraft manufacturers as chemically cut and patterned blanks.

**Baggage conveyer belt** made by B. F. Goodrich is in use at San Francisco International Airport. Rubber fabric belt carries 300 pieces of luggage over a tortuous route from ramp to terminal in five minutes.

**Magnaflex Corp.** now offers magnetic particle inspection materials in pressurized spray cans and plastic squeeze bottles. Newly packaged materials can be used with any magnetic particle inspection equipment now in operation.

**New oxygen supply system** for jets has been developed by Aeronautical and Instrument Div. of Robertshaw-Fulton Controls Co. System is fully automatic and altitude compensated, supplies a wide variety of pressures for emergency use.

**New aircraft tach generator** by General Electric is offered for any application where auxiliary power source is required, can be adapted to any presently flying aircraft with standard AND-20005 mounting pad. The 2.7 lb. tachometer-generator includes an integral AC power supply for control subsystems, makes possible elimination of separate subsystem power supply.

**Lightweight aircraft deck faucet** is available from Bobrick Dispensers, Inc. It features self-closing hot and cold handles, is compatible with either gravity or pressure systems to 60 psi. Weight is 2.5 lbs.

## INFO FOR THE ASKING

**Training manual**—Part 14b, *Air Traffic Controller Radar Rating*, first edition, 1960 (49pp) is available from the International Civil Aviation Organization, Montreal. Price is \$.50.

**Platform truck**—Folder describing Kalamazoo K45 industrial platform truck suggests uses around airports for hauling baggage and other light cargo.

**Cargo conveyer**—Sheet from Cochran Equipment Co., describes Model CKC-600 Cargo King conveyer for aircraft loading.

**Rate gyros**—Booklet, *The Rate Gyroscope*, presents engineering discussion on angular velocity sensors for rate gyroscopes. Fifty-five-page publication is copyrighted by Aircraft Instrument Div., R. C. Allen Business Machines, Inc.

**Jet starting**—Colorful booklet by Breeze Corp. gives details on JetAir self-propelled starters for airline operations.

**Engine stand**—Catalog from Garsite Products discusses low-cost engine stand designed for JT-3 and JT-4 engines.

**Tube replacement**—Sylvania brochure is guide to replacement of tubes used in airborne electronic equipment. Seven pages list tube type, manufacturer, and Sylvania direct replacement.

**Marketing**—Folder gives information on markets and products available over the world and explains services available from Pan American World Airways for expanding business.

**Aircraft radios**—Available from General Electric is Bulletin ECR-870 describing the company's new Pacer line of compact, economy two-way radio equipment.



## Don't blindfold him!

THE MAN in this picture is a cancer research scientist. The device he is using looks like something out of science-fiction—but actually, it's an electron microscope. It shows him the sub-microscopic detail of a cancer cell—magnified 100,000 times. The cost of one electron microscope is \$35,000.

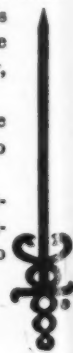
Some of the equipment needed for cancer research, and purchased with American Cancer Society funds, is even more expensive.

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### ADVERTISERS' INDEX

Airwork Corp. .... 18	De Havilland Aircraft Co. Ltd. .... 51	Napier Engines ..... 10
Agency—Gene Wyble Adv.	Agency—Samson Clark	Agency—Hillen J. Smith Co.
American Airlines, Inc. .... 32	Delta Air Lines, Inc. .... 48	Northeast Airlines, Inc. .... 12
Agency—Young & Rubicam, Inc.	Agency—Burke Dowling Adams, Inc.	Agency—J. Walter Thompson Co.
Bendix Corp., The, Bendix-Pacific Div. .... 71	Detecto Scales, Inc. .... 12	Northrop Corp., Norair Div. .... 46, 47
Agency—Shaw Adv. Inc.	Agency—J. M. Kesslinger & Assoc.	Agency—Doyle, Dane, Bernbach, Inc.
Bendix Corp., The	Douglas Aircraft Co., Inc. .... 4	Phillips Petroleum Co. .... 28
Bendix Radio Div. .... 8	Agency—J. Walter Thompson Co.	Agency—Lambert & Feasley, Inc.
Scintilla Div. .... 40	E. I. Du Pont De Nemours & Co. .... 14	Pratt & Whitney Aircraft Div., United
Agency—MacManus, John & Adams, Inc.	Agency—Batten, Barton, Durstine & Osborn, Inc.	Aircraft Corp. .... 16
Boeing Airplane Co. .... 3	General Electric Co., Flight Propul- sion Div. .... 26, 27	Agency—Campbell-Ewald Co.
Agency—Fletcher Richards, Calkins & Holden, Inc.	Agency—George R. Nelson, Inc.	Puritan Compressed Gas Corp. .... 42
Branniff International Airways .... 52	Hawker Siddeley Aviation Div., Arm- strong Whitworth Aircraft, Ltd. .... 55	Agency—Richard Lane & Co.
Agency—Cunningham & Walsh Inc.	Agency—Batten, Barton, Durstine & Osborn Ltd.	Rolls-Royce, Ltd. .... 43
British Aircraft Corp. .... 35, 36, 37, 38	C. G. Hokanson Co., Inc. .... 65	Agency—The Wesley Associates, Inc.
Agency—McCann-Erickson Adv.	Agency—The Essig Co.	Sikorsky Aircraft Div., United Air- craft Corp. .... 56
Burns Aero Seat Co., Inc. .... 50	International Telephone & Telegraph Corp., Federal Div. .... 2	Agency—Campbell-Ewald Co.
Agency—The Essig Co.	Agency—Gaynor & Ducas, Inc.	Texaco, Inc. .... 45
Calco Mfg. Co. .... 68	Minneapolis-Honeywell Regulator Co. 6, 7	Agency—G. M. Basford Co.
Agency—Kreicker & Meloon, Inc.	Agency—Footo, Cone & Belding	Vapor Heating Corp. .... 13
Collins Radio Co. .... 25	Mohawk Airlines, Inc. .... 64	Agency—William Hart Adler, Inc.
Agency—W. D. Lyon Co.	Agency—Farquhar & Co., Inc.	Warner Lewis Co. .... 72
Continental Development Corp. .... 67		Agency—Paul Locke Adv., Inc.



## Weather Ruins a Perfect Plan... But Kruger Park is Great

I wonder how many inaugural and press flights in airline history have gone haywire because the weather or some small mechanical failure has completely disrupted the best-laid plans and turned the event into a first class shambles? There have been quite a few, more than the guys with gray hair and ulcers like to think about.

Alitalia had some wonderful plans laid out for the inaugural of its DC-8 service from Rome to Johannesburg, South Africa, last November. I was one of some 65 guests from many countries. All other seats were filled with paying customers, and that's quite a load.

Everything was going just fine. We left Nairobi in the heart of Africa on time and were due at Johannesburg early in the morning. A big reception committee was waiting. Buses were ready to take us to our hotels for a round of festivities and preparations for the big trek to Kruger National Park to see wild life in the raw.

But Jan Smuts Airport closed. It was socked in tight, with heavy rain and low ceiling. So where could we go on an early Sunday morning with a jet filled with more than a hundred people? We headed for Durban, the big resort city on the Indian Ocean coast about 400 miles southeast. Although ours was the first big jet ever to land there, our Alitalia pilot made a terrifically smooth landing. It was hot and humid. The terminal is small. The only international flights coming in there are DC-3s from neighboring Portuguese East Africa, so it's a small port of entry unprepared for big jets.

### Then came chaos

I won't go into details about the chaos, but everybody was tired. We were all dressed too warmly for the climate. There weren't enough seats in the terminal. A stewardess grabbed off the only couch in the ladies' room and went to sleep. A Greek woman, ill with high fever, had a baby which screamed bloody murder all the time. There was no place to clean up. We waited around for six hours before it became obvious at noon that Johannesburg wouldn't open up and we would stay the night in Durban.

Okay, but by that time the two immigration and customs men had gone home to a long Sunday dinner and hadn't planned to be back before 5 p.m. Nobody had thought to alert them. One had left his home for an afternoon fishing trip. It was mid-afternoon before one customs guy tried to tackle a jet-plane-load of baggage. By late afternoon we had been taken into town for a night at a resort hotel, fortunately one with rooms available since this was not the height of the season. Next noon we arrived in Johannesburg—and Alitalia's fine plans had blown skyward.

The problem of the unscheduled land-



**STOP YOUR** car near some monkeys and they'll clamber on board. (WWP snapped this one.)

ing with a big jet is historically engrossing. You can handle a DC-3 load, somehow. Even a DC-4 load isn't too unmanageable, under most circumstances. But more than a hundred passengers, especially when they are of many races, nationalities and languages, and of all walks and stations in life, and of many occupations, trades and professions—well, that's the rub. It's a new phenomenon in history when so many people, of such diverse origins and backgrounds, find themselves unexpectedly melded together into a common fate of complete helplessness, far from their destinations.

I thought of the Alitalia experience just recently when I left Paris at 1 p.m. on a Saturday afternoon in an Air France 707 expecting to make connections at Idlewild so I could get to my home in Washington for dinner and my favorite TV program, Perry Mason. (I left a day early to see old Perry, I must confess. Probably I'm the only quack in the world who would forsake a Saturday night in Paris for a TV show, but that's a sign of old age.) My seat companion was an art expert scheduled to give a lecture that night in New York.

Everything was just fine. The 707 was full and Air France put on one of its super-splendiferous gourmet luncheons (although I'll wonder to the rest of my days why we weren't offered a cocktail in advance). But Idlewild and every other major airport in the east closed in and we landed at Goose Bay in Labrador and stayed there about ten hours. It was ten below zero. There was nothing but snow. There were only half enough seats in the so-called terminal and the modest "Airlines Inn" for those on board.

The mink coats mingled with the merchant seamen. First class and economy class became one as we scrambled in and out of those primitive Far North buses. Nobody complained, but it was an unexpected Arctic experience on what was to have been a routine eight-hour flight from Paris to New York. Jets have brought some real problems not found in the maintenance manuals or travel ads.

But let me continue about South Africa. I've always wanted to see Kruger

Park, a game reserve 200 miles long and 40 miles wide with 1400 miles of roads, established by the Union of South Africa as a haven for wild life of all kinds. You drive with complete freedom along the roads but you are strictly prohibited from getting out of your car at any time. You take your chance at seeing wild life and you have to have pretty good eyes to spot some of it.

You turn in the bend of a road and you may see a herd of giraffe, or a lion sitting in the road and blocking your way, or a leopard crossing in front of you, and so forth. As long as you're in the car, the wild animals pay no attention whatever and they don't catch the odor of the human being above the meaningless odor of the auto and gas fumes.

Kruger Park is a great institution and the world owes a debt to the Union of South Africa for its existence. Wild animals are disappearing with alarming rapidity in Africa, especially in the Congo where the natives have been slaughtering them with reckless abandon (mostly for food) since the Belgians left.

Of course, Kruger is not the only game reserve in Africa. There are big ones in Kenya Colony, the Rhodesias and other places. But there are some countries, such as Portuguese East Africa, where hunting is still permitted and the wild life population is decreasing steadily.

Our safari to Kruger, about 175 miles northeast of Johannesburg, was also plagued with troubles. They simply aren't used to handling big tours down there and a firm called Springbok Safaris, managed by a nice and well-informed guy by the name of Bill Olds, undertook to transport our guest group by buses.

### Those bearings and tires

On the way to Kruger the bearings of the engine in my bus burned out and our group found itself stranded after dark on the roadside until some other buses came along. Powered with Chevrolet engines, the Belgian-made buses were just not equipped for tours into the hill country. Returning to Johannesburg my bus had tire trouble twice and some of us ended up hiring taxis for the last 100 miles to the city.

However, I don't want to be too hard on Springbok Safaris. Bill Olds has his troubles, especially hiring enough good personnel for big jobs. Let's call it bad luck. The best and only way to travel in South Africa is in small groups or with your own rented car, with or without driver, and you'll get along just fine.

As for Kruger, we were there the wrong time of year. From October 15 to May 1 only a small portion of the big park is open, due to various reasons not altogether clear to me. We saw no elephants—they had moved to the north. We saw no lions. But I did see a beautiful leopard, and quite a few giraffes and lots of other wild life. The best time for Kruger—in fact, the only time that is winter while—is May 2 to October 15. If you drive around for a few days you'll see everything.

Accommodations are modest but quite adequate. So is the food. This is the one park where the visitors are locked up for the night—you sleep and eat in camps that are protected from the wild animals. No driving is permitted after dark. Advance reservations are imperative. The Union would do well to limit the number of its own people who are just there for vacations, camping, etc., and keep the Park exclusively for those who want to see wild animals close up in their natural habitat under informal conditions. ■

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